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FOUNDED BY WILLIAM HUNTING, F.R.C.V.S., 1888.

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National Veterinary Medical Association of Great Britain and Ireland.

FIFTY-SECOND ANNUAL MEETING, EDINBURGH, 1934.

Presidential Address

BY

WILLIAM NAIRN, M.R.C.V.S.

BLAIRGOWRIE, PERTHSHIRE

The fulfilment of the requirements of the articles of association of the "National" must be my apology for subjecting this meeting to the following remarks.

It must have been the desire of those who drafted the articles that advantage should be taken of the excellent opportunity afforded by our annual meeting of informing this large body of members of the aims and ideals of our labours.

In the turmoil of to-day aims and ideals are apt to be overlooked and we are more impressed by the immediate disadvantages of the day's development; it is therefore fitting that in the detachment of this Congress we should calmly examine the position of our profession.

The collective efforts by fully organised bodies within our profession are shared by two organisations—the Royal College of Veterinary Surgeons and the National Veterinary Medical Association. Both have played an important part in the evolution of our position to-day, but until recently there was no definite appreciation of the sphere of activity of each and it was found frequently that overlapping of effort took place. To-day, almost by tacit agreement, each allocates to the other those matters which can be more fittingly dealt with by that body.

There is an advantage to both in this procedure and I do not think the Royal College of Veterinary Surgeons will raise any serious objections to my suggestion that their activities mainly deal with questions affecting the education and ethics of the profession.

The Royal College, with a desire to provide the country with a highly trained profession, have recently increased the length of the curriculum to five years, and have added to that the institution of courses of post-graduate study in Public Health and Tropical Medicine. It must be agreed, therefore, that they have made considerable effort to carry out the responsibilities of their office as the examining body of the profession. It would be to the further advantage of the profession, I think, if there were a closer liaison between the Royal College of Veterinary Surgeons and the teaching institutions of the country, so that any slight defect in the teaching facilities might be remedied by a less archaic method than referring students.

If I were to try and define the functions of our National Association I should find more difficulty, because it has been my experience as President that our members consider that it exists to deal with any difficulty that may be troubling them or any which may arise in the next ten years.

I would suggest, however, that its main functions are to extend a helping hand to any progressive movement in our profession and to try as far as possible to protect the interests of its members.

It is not always a question of protection from outside forces: frequently it amounts to the adjustment of a balanced equity between members. We have been criticised for our efforts to maintain a fair scale of salaries for those holding appointments, but I would point out that a reasonable scale is in the interest of public bodies as much as in that of our profession. More applicants, and those usually better qualified, are thereby made available, and those who have such posts to fill are more likely to get an efficient service by fair remuneration than by any cheap method. If the profession is to attract promising young men to a course extending to five and six years, it is essential that their subsequent reward be adjusted with a due regard to these facts.

During my association with the veterinary

profession I have seen it change from a body composed entirely of practitioners to one of various sections which have arisen to supply the public demand for the services of men trained to meet the requirements of diverse fields of veterinary activity. We have seen the development of the Veterinary Department of the Ministry of Agriculture for the control of scheduled diseases of animals and the origin and development of a veterinary public health service for the safe-guarding of foods—mainly meat and milk. Then there has been established what is now a considerable colonial veterinary service, and, lastly, within recent years we have witnessed the rise of a research section which, we are pleased to note, has already justified its creation.

From all these groups the National Veterinary Medical Association obtains its members and therein you find the *raison d'être* of some of the difficulties which confront your Council when it endeavours to hold the balance between two or more sectional interests. The "National" has so far succeeded in doing so without provoking any serious internal upheaval which was more than the restlessness of a healthy vigour and I hope and feel sure that the good sense of our Councils in the future will maintain such balance of administration, that no greater disturbance will hinder the progress of the good work.

It will be agreed, I think, that the most valuable contribution made by the National Veterinary Medical Association to our professional progress has been the provision of an up-to-date journal—our *Veterinary Record*. In it we find the records of divisional activity, clinical articles of interest and also the fruits of recent scientific research.

While the last few years have produced a larger and better journal, one would like to see a proportionate increase in the records of clinical observation, as in this section we are not making any noticeable advance. There are sufficient competent observers within the ranks of our profession to fill an excellent journal, but through some cause—perhaps the greater rush of life in cars—they do not seem to have time to give to their fellows the results of their daily observations. Thus a great deal of valuable knowledge is lost and one wonders if this paucity of clinical material is entirely due to the rush of life. I understand that our Editorial Committee has been giving its attention to this question and that it has agreed to pay for these communications as a possible remedy; but no Editorial Committee can by itself solve this difficulty. That requires the active support of all the members of our Association.

It is essential that our National Association should keep a careful watch on any legislation which may prejudice the interests of our profession.

There is no end to the problems put before your Council and one of the most difficult was presented by the friction produced in certain areas by the Veterinary Advisory Scheme of the Ministry of Agriculture. This scheme was no doubt devised with the laudable aim of helping a depressed agriculture by the provision of a service which it was hoped would help to reduce the burden of disease among the stock, and with that desire we must express the utmost sympathy.

The somewhat ambiguous instructions issued for guidance of these officers, which may on occasion have been interpreted too literally and with barely sufficient appreciation of the claims of practitioners, may have disturbed what should really be a friendly co-operation. Certainly, there can be no question that if such a service were conducted in such an atmosphere the practitioner would gain from the presence and help of one trained in laboratory technique and with some knowledge of research. While the instructions issued to the Veterinary Advisory Officer stated that he should inform the local practitioner and invite his collaboration, it should have been evident, however, that an invitation from the Advisory Officer was not sufficient. It should be obligatory for the farmer to invite the practitioner, otherwise few practitioners would care to accept.

The Committee of our Council dealing with this matter sent a deputation to discuss the various difficulties with the Ministry of Agriculture and had a very pleasant reception. I feel sure that an effort will now be made to remove all causes of trouble—let us hope that in the better atmosphere developing practitioners and advisory officers will, in close collaboration, again take up the various problems in their area.

If it should happen that any further difficulty should arise, one would ask our members to bring it to the notice of the "National," but I would appeal to them, before doing so, to try a more friendly co-operation in the better atmosphere which should be created as a result of your committee's discussions with the Ministry of Agriculture.

The depression in agriculture has adversely affected many of our members, and this makes it all the more essential that the "National" should make careful scrutiny of any measure put forward to relieve the lot of our primary producers.

To-day, it would seem, the troubles of the industry lie in the distributing side, and not, as formerly, in the producing department. The various possible solutions being tested are quotas, tariffs and marketing schemes—all with a view to ensuring the home producer a higher remuneration for his labours than he could

obtain in a free market. I am hopeful that success will yet crown the efforts of our Minister of Agriculture, as he has shown in a grave crisis more initiative than any other occupant of that office in recent years.

The activities which may have repercussions on our professional labours are the various milk marketing schemes, with their accredited and attested herds list.

At present the original aims of some of these marketing schemes have not been achieved and one rather fears that for their success further control of production and distribution is inevitable. While these schemes were devised in the interests of producers, I venture to prophesy that unless they take cognisance of the wishes of consumers they will fail of achievement.

The consumer asks that milk shall be free from infection harmful to health and that it shall be sold at a price within the reach of the majority of the nation. The attainment of the consumers' desires can only be realised through the labours of our profession, for, when we achieve the first we will put the producer in a position to grant the second—cheap milk. The Grigg Commission, which was appointed to consider every aspect of the milk question, in its report emphasised the need for an extension of compulsory veterinary inspection of cows, but these recommendations have been considerably extended by the Cattle Diseases Committee of the Economic Advisory Council. Some will undoubtedly criticise this report, but we must all admit that, generally speaking, it will put our profession into a more important and influential position in public life than has hitherto been the case.

With the desire to reduce the dangers to public health from the consumption of infected milk, we, as a profession, must be in complete sympathy, but we cannot view with entire approval all their recommendations to that end. I do think the committee could have submitted their recommendations without attacking, in a loosely generalised manner, the integrity of our practitioner members.

The " National " has all along considered that it is possible to guarantee the safety of foods by eradication of disease from herds and other measures of control without, at the same time, eliminating the clinical skill of practitioners.

We have also agreed that the public health inspection of animals should be controlled in every area by whole-time officers. We took the view, moreover, that a reduction of the influence of local authorities would give the whole country a more equitable standard of administration and the advantages arising therefrom.

No doubt many of you are disappointed in the decisions of this Committee, but we must recognise, if we examine somewhat analogous experiences in the medical profession, that after further trial the things that were feared turned out to be blessings and so I hope we may find it in our case.

Should the recommendations receive legislative authority they will make the inspection of cows compulsory in England and Wales—a state of affairs which, while constituting a radical change for those countries, in Scotland would mean little alteration in the present system.

The scheme suggested for the eradication of tuberculosis is a voluntary one and will not lead to any very startling developments in many areas, but one would hope that in the dairying districts the payment of a bonus for tubercle-free milk will stimulate that movement. There are many practitioners in these areas who have performed considerable pioneer work to encourage and assist in the production of infection-free milk, and it must be with considerable regret that they see the results of their labours passed on to others. The country at the present time, however, has not and cannot have for long to come, the whole-time staff requisite for this work, and of necessity, if not of choice, the services of practitioners in the work of tuberculin testing and even routine examination of cows, will be essential.

There is here a difficult problem which both whole-time officers and practitioners within the " National " should approach immediately, making an effort to draft a scheme which would provide an ample service in the immediate future.

The recommendations dealing with other diseases—abortion, Johne's disease and mastitis—insist on the need for further research, and with that I think all will agree. There is also the suggestion that whenever our increased knowledge of these conditions permits, they, too, should be dealt with by the whole-time veterinary service to be appointed. This would make such serious inroad into the earning of country practices that it would be found in disease eradication, as it has been found in other fields, that control would compel further control and our legislators would be forced by circumstances to adopt a State veterinary service.

I feel sure that my fellow members will, if it should be found necessary in the interests of public health to adopt these measures, loyally give them their support, though at present there are many unconvinced that these are the best measures by which to attain the end in view.

These questions to which I have just referred have excited considerable interest among the members of the " National " and if that interest had been dominated at all times by a generous regard for the public well-being and the best interests of our profession, one would not have viewed these developments with the same anxiety.

It should be possible and would undoubtedly

be the wisest course, to give the public the best opinion of the profession through our Association. If only everyone would be prepared to collaborate to that end, it would tend to avoid the confusion of view which is presented by the profession at the present time.

To provide the veterinary service for the country, as envisaged in some of the schemes, and to do so within a few years, will require a much wider collaboration than many seem to appreciate at present. It is, therefore, with very great regret that one notes the appearance of the subsidiary bodies in the profession which claim considerable freedom of action and yet operate somewhat in the manner of secret societies without any publication of the records of their discussions.

We see a section of our profession—and moreover that section which has obtained and is most likely in future to obtain the greatest benefit from the activities of the National Veterinary Medical Association—acting independently in matters of vital importance to the whole profession and seemingly prepared to oppose any considered view of the "National" if that be not altogether agreeable to this group.

I feel sure that those responsible for this phase of irregular activity have not considered fully the dangers of this course and one would hope they will realise that it is essential to the ultimate well-being of the nation as well as to themselves that the furthering of the small and petty interests of groups should be restrained in favour of an attitude more worthy of a scientific profession. Most members, including members of these sectional groups, wish the "National" to advance in strength and true helpfulness for the common good. If this is our ideal, then it should be the endeavour of all to subordinate personal and sectional interests to the collective efforts of our Association.

All groups have opportunities within that body of expressing their views and if they are offering truly constructive advice I am certain that our Council will accord it every consideration.

The great task which lies before the profession for the protection of the public health calls for the collective wisdom of the whole profession and will provide sufficient difficulties in the near future without the addition of such as must inevitably arise from internal disharmony.

It is well that, at this time, when we have left behind us for a week "the daily round and common task," we should give our thoughts to the higher aspirations of professional life and appreciate our obligations not merely to ourselves, not merely to a group, not merely to our profession, not merely to our nation even, but to the greater ideal of a constant effort towards unity and harmony—the eternal verities.

We can only be true to this higher aim when we think not in units but in unity. Let me, then, appeal to all to offer to the nation at this time and with one voice the combined wisdom of our profession, so that the great tasks ahead may be carried through in a manner befitting our nation and with honour to our profession.

The Veterinary Record

August 25th, 1934.

THE N.V.M.A. CONGRESS AT EDINBURGH

VIEWING the Congress at Edinburgh as a whole, it may be truly affirmed that it was the most successful Congress that has ever been held, both in regard to the numbers attending, the quality and scope of the papers presented and the discussions that ensued. The displays and demonstrations on the Thursday were of particular interest to the practical mind of the practitioner in the advancement of veterinary science and up-to-date procedure. Generally speaking, too, it may be taken for granted that the sections explored as fully as possible the cause and effect of the various diseases affecting animal kind, and control of the same was adequately foreshadowed for the better amelioration of animal suffering and for that due regard for human health which, after all, is a very necessary factor of veterinary scientific endeavour.

In the latter respect the addresses and discussions on "The Eradication of Bovine Tuberculosis"—to be reproduced in full in an early issue—should have an important bearing on the formulation of a plan of campaign in medical and agricultural circles for the better control of that insidious disease, exacting as it does such a heavy toll of human and animal life and entailing a heavy financial loss to the State and to the agricultural and milk-producing communities. The time is ripe for very drastic and complete action to be undertaken by State authorities and for the mobilisation of veterinary effort in such action. The cow being such an arch offender, it is a *sine qua non* that the veterinary surgeon, and the veterinary profession generally, should be the first plank in any scheme of eradication. It is, moreover, expedient that the deliberations of the Edinburgh Congress on the subject should be brought home to all those councils and committees which have been set up by the State for enquiry into incidence and more adequate control.

The social side of the Congress, as is usually the case, was accorded that prominence which is its due on such an occasion. The various tours to places of interest were very enjoyable. The informal "At Home" at the Royal (Dick) Veterinary College on the Sunday evening, the Civic Reception at the Art School, the President's Reception at the Freemasons' Hall, the Annual Banquet at the Freemasons' Hall, and the Dance at the Freemasons' Hall in aid of the Ladies' Benevolent Guild, on successive evenings, and the Golf Competitions, all added to the enjoyment and success of the Conference.

The thanks of the National Veterinary Medical Association are due to the Principal and Governors of the Royal (Dick) Veterinary College for their kindness in placing the College at the disposal of the Association for the purposes of meetings, demonstrations and exhibitions, and to the Provisional Committee and its energetic Local Secretary for their part in making the necessary arrangements.

It is sincerely to be hoped that the next Annual Congress at Belfast will be equally successful, both in point of view of the quality of the papers presented and in the numbers attending.

ANIMAL DISEASES RESEARCH ASSOCIATION

The Annual General Meeting of the Association was held on July 18th, the President, Mr. Falconer L. Wallace occupying the chair. Nominations were made of representatives of the Association to serve on the Scottish Research Board in Veterinary Science.

Dr. J. Russell Greig, Director, Moredun Institute, gave an account of the year's work. The Association is anxious to enlarge the scope of its activities, and a scheme costing £10,000 for capital expenditure is under consideration, the existing accommodation being inadequate.

Grass sickness requires the whole-time services of a trained research worker. The importance of the disease was emphasised and reference was made to the investigation of bacterial toxins in the alimentary tract in this disease.

A micro-organism contained within leucocytes is considered to be the causal agent of "tick-borne fever" of sheep. About 26,000 lambs and 12,000 hoggs were vaccinated against louping-ill, and the results have indicated that the mortality was thereby very much reduced. Sixty-one thousand doses of lamb dysentery serum and 41,000 doses of braxy vaccine were issued during the year, with good results. It is hoped that a single dose braxy vaccine will be evolved to replace the existing two-dose vaccine.

The importance of minerals and vitamins in the food in relation to ovine enzoötic abortion is receiving consideration. The Association is undertaking its share of the work arranged by the Scottish Committee on Bovine Contagious Abortion.

Among other conditions dealt with were lactation tetany in cattle, scrapie in sheep and iron deficiency in sheep.

CONGRESS ATTENDANCE LIST

We give below the list of delegates, members and visitors who attended the Annual Congress of the Association, Edinburgh, 1934. Every effort has been made to render the list complete, but inasmuch as it would appear that many of those who took part omitted to sign the Attendance Book, there are inevitably some omissions.

Members

Mr. W. Nairn (President), Mr. D. H. Aldis, Captain James Anderson, Major R. G. Anderson, Captain W. Anderson (Fife), Captain W. Anderson (Glasgow), Captain A. H. Andrew, Mr. H. Andrew, Captain E. F. Angler, Messrs. H. Bain, A. W. Baird, N. S. Barron, J. K. Bateman, H. Bell, Captain R. C. Bickerton, Captain N. Bisset, Professor G. F. Boddie, Messrs. H. W. Steele Bodger, E. C. Bovett, Lieut.-Colonel H. G. Bowes, Mr. A. R. C. Bowie, Captain V. Boyle, Mr. O. Charnock Bradley, Captain H. H. Brodie, Messrs. G. B. Brook, D. Brown, E. Brown, J. Brown, T. G. Browne, A. Brownlee, H. Burrow, A. Eccles, A. Edgar, J. T. Edwards, Dr. J. T. Edwards, Mr. S. J. Edwards, Captain W. G. Evans, Messrs. K. A. Forker, A. B. Forsyth, W. Gardner, A. Gibson, J. H. Gillespie, Captain H. Gillmor, Messrs. T. N. Gold, F. L. Gooch, J. C. Grant, Miss A. W. Greener, Lieut.-Colonel H. Greenfield, Dr. J. Russell Greig, Captain O. V. Gunning, Messrs. T. F. Hall, A. P. Hamilton, Major W. Harris, Mr. C. G. Hill, Captain S. E. Hill, Sir Frederick Hobday, Major T. H. Hobson, Messrs. H. M. Holland, H. H. Holman, J. W. H. Holmes, J. Holroyd, W. F. Howes, R. Hudson, Captain H. T. Hughes, Mr. D. Imrie, Messrs. T. M. Inglis, W. A. Ireland, W. J. Ironside, D. S. Jack, H. Llewelyn Jones, H. C. Kelly, A. J. Kennedy, W. R. Kerr, N. S. King, Major W. H. Kirk, Mr. E. M. Lamb, Captain W. W. Lang, Mr. A. M. Larnach, Professor R. G. Linton, Captain P. T. Lindsay, Miss B. L. Lock, Mr. G. H. Locke, Major W. S. Lornie, Messrs. J. Lyon, J. H. McCrea, Professor J. McCunn, Mr. A. Macdonald, Mr. J. Macdonald, Captain John Macfarlane, Mr. J. McGhee, Major J. G. McGregor, Major W. A. MacGregor, Mr. W. M. McKay, Captain W. R. McKinna, Mr. J. W. McIntosh, Captain A. McLean, Messrs. J. McQuaker, J. I. Magowan, G. P. Male, J. Martin, C. Masson, Professor D. C. Matheson, Messrs. P. Meikle, D. W. Menzies, W. C. Miller, R. Mitchell, Captain T. M. Mitchell, Professor W. M. Mitchell, Dr. R. F. Montgomerie, Major-General Sir John Moore, Captain S. J. Motton, Mr. G. D. Munro, Captain R. E. Murison, Messrs. G. M. G. Oliver, K. Ollerhead, W. W. Peggie,

C. E. Perry, Captain B. Philp, Mr. G. F. Pickering, Captain J. F. Player, Mr. J. Reid, Captain A. J. S. Reynolds, Mr. W. J. Rice, Captain J. R. Rider, Major P. B. Riley, Major A. Linton Robertson, Messrs. S. C. Salaman, G. A. Sangster, Captain F. C. Scott, Messrs. W. Scott, E. J. H. Sewell, S. Sharp, Captain C. F. Shawcross, Miss K. W. Shedlock, Messrs. A. M. Sievwright, A. Sillars, Captain R. Simpson, Messrs. J. Smith, R. M. Smith, W. Smith, A. Spicer, Major A. Spreull, Messrs. James Spreull, J. S. A. Spreull, A. Stark, F. A. Stewart, J. Stewart, Captain W. Lyle Stewart, Miss Marion Stewart, Mr. R. Swaby, Mr. G. B. Taylor, Captain J. F. Taylor, Messrs. G. H. Thomas, T. R. Thomas, A. Thomson, Captain J. B. Tutt, Captain W. Tweed, Messrs. A. C. Urquhart, A. Walker, J. P. Walker, Major E. Wallace, Mr. C. V. Watkins, Captain A. H. Watson, Mr. H. C. Watson, Captain W. Watt, Dr. A. W. Whitehouse, Messrs. T. Wilkinson, R. A. Willett, D. R. Wilson, H. M. Wilson, J. E. Wilson, E. G. Wood, Professor J. G. Wright, Captain A. Young, Messrs. T. P. Young, W. Jackson Young.

Delegates

Ministry of Health.—Dr. W. A. Letham, M.C.

Ministry of Agriculture and Fisheries.—Capt. W. G. Wragg, M.R.C.V.S.

Ministry of Agriculture, Northern Ireland.—J. McAllan, Esq., M.A., B.Sc., M.R.C.V.S.; H. G. Lamont, Esq., M.Sc., M.R.C.V.S.; W. R. Kerr, Esq., M.R.C.V.S., D.V.S.M.

County Councils.—

Aberdeen, Capt. G. Howie, F.R.C.V.S.; Ayr, Major Alex. Douglas, M.R.C.V.S., D.V.S.M.; Brecknock, A. J. Cattell, Esq., M.R.C.V.S.; Dumbarton, J. McDougall, Esq., M.R.C.V.S.; Cheshire, A. B. Kerr, Esq., M.R.C.V.S., D.V.S.M.; Durham, Councillor William Kelly, and L. E. Perkins, Esq., M.R.C.V.S.; Essex, Capt. F. W. Medlock, M.R.C.V.S.; Fife, Major R. G. Anderson, F.R.C.V.S.; Glamorgan, County Alderman Joseph Dicks and J. Howard Jones, Esq., O.B.E. M.R.C.V.S.; Kent, Dr. C. Ponder, Assistant County Medical Officer, and S. B. Vine, Esq., M.R.C.V.S.; Lanarkshire, James Russell, Esq., Chairman, Diseases of Animals Committee, and Hugh Begg, Esq., F.R.C.V.S.; London, Capt. W. J. Leyshon, M.R.C.V.S.; Midlothian, R. B. Allan, Esq., and J. N. Ritchie, Esq., B.Sc., M.R.C.V.S., D.V.S.M.; Renfrew, S. G. Abbott, Esq., M.R.C.V.S.; Stirling, Major J. G. McGregor, T.D., M.R.C.V.S.; Surrey, E. Clark, Esq., M.R.C.V.S., D.V.S.M.; Sussex (West), L. Jordan, Esq., PH.D., M.R.C.V.S.; Yorkshire (West Riding), Major D. S. Rabagliati, B.Sc., F.R.C.V.S., D.V.S.M.

City and Town Councils.—

Belfast, Dr. J. D. Williamson, J.P., Chairman Public Health Committee, and A. McLean, Esq., M.R.C.V.S., D.V.H.; Cardiff, L. B. A. Grace, Esq., M.R.C.V.S., D.V.S.M.; Dundee, Hugh Ferrier, Esq., F.R.C.V.S.; Edinburgh, Councillor Barbour Simpson, John Guy, Esq., M.D., D.P.H. (Medical Officer), and Arthur Gofton, Esq., F.R.C.V.S.; Glasgow, A. M. Trotter, Esq., M.R.C.V.S.; Huddersfield, W. R. McKinna, Esq., M.R.C.V.S., D.V.S.M.; Hull, H. P. Lewis, Esq., M.R.C.V.S.; Leeds, Councillor Lizzie Naylor (Chairman, Cattle Diseases and Milk and Meat Sub-Committee), Lt.-Col. J. A. Dixon, T.D., M.R.C.V.S.; Liverpool, Capt. A. W. Noel Pillers, F.R.C.V.S., D.V.S.M.; Manchester, Councillor S. Fitton, Councillor Howard, W. K. Johnstone, Esq., M.R.C.V.S., D.V.S.M., R. C. Locke, Esq., M.R.C.V.S., D.V.S.M.; Newcastle-upon-Tyne, Thomas Parker, Esq., F.R.C.V.S.; Paisley, Capt. Jas. Andrew, M.R.C.V.S.; Preston, Major R. Finch, M.R.C.V.S., D.V.S.M.; West Ham, H. E. Bywater, Esq., M.R.C.V.S.; Wigan, Wm. Woods, Esq., F.R.C.V.S.

Visitors

Mr. T. M. Alexander, Mrs. J. Allen, Mr. J. Armour, Mrs. Begg, Mrs. W. P. Blount, Mrs. Steele Bodger, Mrs. David Brown, Mrs. V. P. Bovett, Miss B. Bowes, Mrs. E. Bowes, Mrs. C. Conchie, Mrs. J. F. Craig, Mr. J. K. Craig, Mrs. Daly, Dr. H. Dryerre, Mrs. Edgar, Mr. and Mrs. J. Edwards, Mrs. R. Finch, Mr. and Mrs. E. N. Gillespie, Mrs. Hepburn, Mrs. S. H. Hobson, Mrs. Holroyd, Miss Holroyd, Mr. Harry Holroyd, Mrs. R. Hudson, Mrs. W. A. Ireland, Mrs. D. S. Jack, Miss Bunty Jack, Mrs. W. K. Johnstone, Mrs. H. C. Kelly, Mrs. A. J. Kennedy, Miss King, Mrs. Lang, Mrs. W. W. Lang, Mrs. Larnach, Mrs. R. C. Locke, Miss M'Dougall, Miss J. Macfarlane, Mrs. McGregor, Mrs. McQuaker, Mr. J. Maffey, Mrs. G. P. Male, Mrs. C. Masson, Mrs. N. B. Matheson, Mrs. Medlock, Miss J. Mimuir, Mrs. S. J. Motton, Mrs. Nairn, Mr. D. D. Ogilvie, Mrs. K. Ollerhead, Mrs. G. F. Pickering, Mrs. A. W. Noel Pillers, Miss M. Pillers, Mrs. L. E. Rabagliati, Mrs. A. Reynolds, Mrs. J. R. Rider, Mrs. R. N. Ritchie, Mr. A. Robertson, Mrs. E. Salaman, Mrs. G. Sangster, Mrs. F. C. Scott, Mrs. W. Scott, Mrs. S. Sharp, Mrs. J. Smith, Mr. E. C. Sparrow, Mrs. J. Spreull, Mrs. J. Stewart, Miss J. C. Stewart, Mrs. Quentin A. Stewart, Mr. M. Forsyth Stewart, Mrs. J. F. Taylor, Miss M. Thomas, Mrs. Roger Thomas, Mrs. V. Tillemont-Thomason, Mrs. S. B. Vine, Mrs. A. H. Watson, Mrs. W. Watt, Mrs. A. W. Whitehouse, Mrs. Wilkinson, Mrs. R. A. Willett, Mrs. P. Wragg, Mr. A. A. Whyte, Mrs. A. Young, Mrs. T. P. Young, and Mrs. W. J. Young.

Total Attendance Recorded 314

National Veterinary Medical Association, Congress at Edinburgh, 1934.

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[Photo by E. R. Yerbury & Son, Edinburgh, 10.

OFFICIAL OPENING OF CONGRESS

Ceremony at the Royal (Dick) Veterinary College

Members of the Association in Academic dress, delegates to Congress, and ladies filled the College Hall on the occasion of the Official Opening of the 1934 Congress of the National Veterinary Medical Association of Great Britain and Ireland, held at Edinburgh, from July 30th to August 3rd, by Bailie Kinloch Anderson (in the absence, on holiday, of the Lord Provost of the City), at 10 a.m., on Monday, July 30th.

The PRESIDENT (Mr. William Nairn, M.R.C.V.S., Blairgowrie, Perthshire) was accompanied on the platform by Bailie Kinloch Anderson, Dr. O. Charnock Bradley, Major-General Sir John Moore, Major J. G. McGregor (Vice-Presidents), Sir Weldon Dalrymple-Champneys, Capt. W. G. Wragg (Hon. Treasurer), Mr. Arthur Gofton, and Major D. S. Rabagliati.

The PRESIDENT: Ladies and gentlemen, on behalf of the Provisional Committee, I would extend to you all a very cordial welcome to this our Congress in the City of Edinburgh. I do hope that our Scottish weather will be kind to us this week, because it is, we must admit, somewhat erratic these days, and it makes a great difference to the pleasure of a congress such as ours to have good weather. Our Provisional Committee have endeavoured to provide for your pleasure this week an interesting programme. They have endeavoured to cater for the various interests represented in our somewhat mixed profession, as we find it to-day, representing, as it does, sections dealing with General Practice, Public Health, Research, etcetera, and you will find papers dealing with all these various sections in our programme. I dare say it may appear to some that our treatment of the Public Health section has been somewhat inadequate, as we have only on this occasion included one item in its programme, but we felt emphatically that the subject we were to discuss was of such importance that it would be a great pity to curtail that discussion by the inclusion of a paper on a minor question. We have also given considerable attention to the social side of the Congress, and those who wish to take part in golf and tennis will, I am sure, get every assistance from our Secretary. Then, in the evenings, in case you should weary in Scotland, we have provided a full programme of events for every night and I think you will all feel that you are in need of a holiday, instead of having had one in Scotland, when you finish your stay here. (Laughter.) It is a great pleasure, I am sure, to the veterinary profession to attend a congress in this City of Edinburgh, because few cities have shown a greater interest in the progress of our profession. (Hear, hear, and applause.) Those who have been associated with the veterinary institutions in Edinburgh know that but for the kindly assistance of the City Council many years ago some of them might not have been able to continue their existence. Our City Council, when I was at college, were, I believe, the Trustees of the Dick College and were responsible for the carrying on of that institution, so you will appreciate how much we are indebted to the Council of the City, and it is, therefore, with great pleasure that we welcome Bailie Kinloch Anderson, who, as representing the City Council, has come here to extend to us a very cordial welcome. (Applause.) Bailie Kinloch Anderson, I understand, like many who serve the public, gives a great deal of his time to that work, and it must have caused him, I am sure, considerable trouble and inconvenience to come here, and knowing how interested he is in his public duties we are very pleased to welcome him as the representative of the City. I will call upon Bailie Kinloch Anderson to address you. (Loud applause.)

Bailie W. KINLOCH ANDERSON (being greeted with loud applause): Mr. President, ladies and gentlemen, it is my duty and a very pleasant duty indeed, to attend here this morning and to extend to this Congress an official welcome from the Corporation of the City of Edinburgh, and in doing so, I would let you know that it is the normal duty of the Lord Provost to attend such functions, but this being the holiday period, the Lord Provost, although being a very busy man, has been able to get away a day or two earlier than he anticipated, and instead of starting on the official date, August 1st, he has been lucky enough to get away from Edinburgh by this time. We colleagues of his, who know the tremendous responsibilities he has and the immense amount of hard work he has put in night and day, are very glad indeed that he has been able to slip away in that way. However, Mr. President, ladies and gentlemen, in his absence I would ask you to be assured that the welcome of the Corporation of the City of Edinburgh to all members of the Congress is no less sincere. (Applause.) Edinburgh is a City of many attractions; a city that is a pleasant place to dwell in for one's whole life—at least, I have found it so, and I have done some 60 years' hard, already—(laughter)—and I think it is a very pleasant place to come to for a congress, because there are certain things which we can show you in the City and it is a good centre for doing other things. Now, Mr. President, as I warned you in the side room, I do not intend to make a speech this morning. I will have the pleasure in my official capacity later in the day, at the Evening Reception, of welcoming you, and as the Scot is traditionally

a man of few words, I do not intend in any way to trespass upon your time further. I am glad to know from the programme which I have in my hand that you are to have an interesting, an instructional and a recreational week, and I again express the opinion that while you are within our gates you will have a very good time, and, I hope, as the President has said, that the weather will be propitious for you during, at any rate, the period of your visit here. (Applause.)

The President: Ladies and gentlemen, Bailie Kinloch Anderson has just said that he hopes to meet us again this evening, and I think it would, therefore, be better that we should defer any expression of our gratitude to him for his presence here this morning until that occasion. (Applause.) As there is no other item on our programme at present, that closes the first meeting. The ice is now broken. (Laughter and applause.)

MEETING OF COUNCIL, N.V.M.A.

The Council of the Association met, at the Royal (Dick) Veterinary College, prior to the Annual General Meeting on the afternoon of Wednesday, August 1st.

The President (Mr. W. Nairn), occupied the Chair and there were also present:—

Messrs. H. Bell, H. W. Steele Bodger, Dr. O. Charnock Bradley, Messrs. David Brown, Esmond Brown, R. E. C. Bullen, H. E. Bywater, Professor J. F. Craig, Lieut.-Colonel J. A. Dixon, Mr. P. F. Dolan, Major G. W. Dunkin, Messrs. A. Gofton, H. W. Griffiths, O. V. Gunning, Sir Fredk. Hobday, Major H. Kirk, Messrs. H. G. Lamont, G. P. Male, J. W. McIntosh, F. McKenzie, Wm. C. Miller, S. J. Motton, Charles E. Perry, A. W. Noel Pillers, Major D. S. Rabagliati, Messrs. W. D. Rees, J. R. Rider (Hon. Secretary), F. C. Scott, S. Sharp, Major Andrew Spreull, Messrs. Alex. Thomson, Wm. Tweed, T. Wilkinson, R. A. Willett, Dr. W. R. Wooldridge, Professor J. G. Wright, and Captain W. G. Wragg (Hon. Treasurer), together with Mr. C. O. Langley (Solicitor), and Mr. F. Knight (General Secretary).

The minutes of the July meeting, having been published in *The Veterinary Record*, were taken as read and were approved and signed, on the proposition of Mr. Gofton, seconded by Mr. McIntosh. Arising out of the minutes, the Secretary read a letter from the Secretary of the Royal College of Veterinary Surgeons, expressing the warm thanks of the Library Committee for the donation of one hundred guineas made by the Association to the R.C.V.S. Library Endowment Fund. Also arising, the following letters were read in connection with the decision of Council to recommend the conferment of the distinction of Hon. membership upon Mr. Arthur Gofton, of Edinburgh, and Mr. Geo. A. Banham, of Stratford-on-Avon, at the Annual General Meeting:—

July 13th, 1934.

Dear Mr. Knight,

Very many thanks for your letter of the 12th inst., intimating that the Council has resolved to recommend my election as an Honorary Member of the Assocation at the Annual General Meeting on August 1st. I am very gratified to learn that the Council have resolved to confer this honour on me.

I need scarcely say that the services I have given to the N.V.M.A. since its incorporation in its present form and during the period which preceded incorporation, were given whole-heartedly and without any desire or hope of reward, but that only increases my appreciation of the way in which the Council have decided to recognise any services which I have given to the Association.

Yours faithfully,
A. Gofton.

. . . . .

July 17th, 1934.

Gentlemen,

I am in receipt of the note of the 12th, from your Secretary which agreeably surprised me.

I did not think there were many now living that remembered anything about the services rendered by me in helping to create the Association from 1881-1890.

Please thank those members, who evidently have read up some of the early history of the Association, and are anxious and willing to recognise the endeavours of its pioneers, for which I most sincerely thank them.

I am afraid it will be quite impossible—however much I should like to do so—to come to Edinburgh and receive the honour at the hands of the President.

I am,
Yours most sincerely,
Geo. A. Banham.

. . . . .

The last matter arising from the minutes was the receipt of a letter from Mrs. MacAlister in appreciation of the Council's expression of sympathy with her in the death of Captain Neil H. MacAlister, of Kirkcudbright.

The receipt was announced of the following apologies for absence: Messrs. J. R. Barker, H. S. Cockburn, J. C. Coleman, Major A. C. Duncan, Mr. E. P. Edwards, Professor S. H. Gaiger, Messrs. G. T. Matthews, R. Barons Nelder, Lieut.-Colonel P. J. Simpson, Mr. R. Simpson, Major F. J. Taylor, Major J. H. Taylor, Messrs. J. Willett, Wm. Woods, and Professor G. H. Wooldridge.

Election of New Members.—The following gentlemen, having filled in the requisite forms of nomination and paid their subscriptions, were elected to membership of the Association, on the proposition of the President, seconded by Mr. Steele Bodger: Miss M. C. Clay (Newcastle-on-Tyne), Messrs. G. J. Jamieson (Haddington), D. R. Macrae (Edinburgh), J. H. McCrea (Londonderry), J. W. McKay (Huntly), David Maloney (London), J. A. Morris (Hounslow).

Annual Report and Balance Sheet.—These were approved, for submission to Annual General Meeting.

Place of Next Congress.—It was agreed to remit this matter to Annual General Meeting for discussion.

ELECTION OF OFFICERS

The following recommendations in regard to the election of officers of the Association for the ensuing year were made unanimously:—

President.—Professor J. F. Craig (Dublin).

Vice-Presidents.—For England (South), Mr. W. D. Rees; for England (North), Captain R. Simpson; for Scotland, Major J. G. McGregor, and for Ireland, Mr. P. F. Dolan.

Hon. Secretary.—Captain J. F Rider (for re-election).

Hon. Treasurer.—Captain W. G. Wragg (for re-election).

General Secretary.—Mr. F. Knight (for re-election).

Auditors.—Messrs. Fairbairn, Wingfield and Wykes (for re-election).

The following appointments were made, with unanimity, by the Council:—

Editorial Representative.—Mr. W. Brown.

Solicitors.—Messrs. Fowler, Langley and Wright.

MOTION BY MAJOR KIRK

The following motion, standing in the name of Major Hamilton Kirk, was considered by the Council:—

" That in future all Council Meetings shall be held in London, except those which are held during Annual Congresses."

Major Kirk spoke to the motion, and after some discussion the Council decided to rescind the following resolution, passed by the Council on April 2nd, 1930:—

" That one meeting of the Council (other than that held on the occasion of the Annual Congress), each year shall be held outside London, the place of meeting to be decided by the Council."

Major Kirk then accepted the following resolution, moved by Mr. Alex Thomson: " That one Council meeting shall be held in Edinburgh each year."

This resolution Major Kirk himself seconded and it was then put to the vote and carried with few dissentients.

Council then adjourned until the conclusion of the Annual General Meeting.

Upon the resumption the following were present: Messrs. H. Bell, H. W. Steele Bodger, R. E. C. Bullen, H. E. Bywater, Professor J. F. Craig, Lieut.-Colonel J. A. Dixon, Messrs. P. F. Dolan, O. V. Gunning, Sir F. Hobday, Messrs. H. Tudor Hughes, H. G. Lamont, Professor J. McCunn, Messrs. J. W. McIntosh, F. McKenzie, Wm. C. Miller, Major-General Sir John Moore, Messrs. S. J. Motton, A. W. Noel Pillers, Major D. S. Rabagliati, J. R. Rider (Hon. Secretary), G. W. A. Sangster, S. Sharp, Major Andrew Spreull, Messrs. Wm. Tweed, T. Wilkinson, Dr. W. R. Wooldridge, Captain W. G. Wragg (Hon. Treasurer). The Secretary submitted the correspondence that had passed between the members of the Executive Appointments Committee and himself in connection with the question of the action to be taken regarding an advertisement received from the Banffshire County Council offering a salary below the Association's scale for an appointment as Chief Veterinary Officer.

During the course of the discussion of the matter the President vacated the Chair, as he had other business requiring urgent attention, and Major-General Sir John Moore took his place.

After prolonged consideration of this matter, the Council decided to request the Banffshire County Council to postpone the appointment and to receive a deputation, consisting of Messrs. Campbell, MacGregor and Weir, for the purpose of hearing the Associaton's case in regard to the raising of the salary to a figure in conformity with its scale and also to enable the Association's representatives to be informed of any special local conditions in connection with the appointment. It was also agreed that representations be made to the Department of Health for Scotland, it being pointed out that such appointments are subject to the approval of the Department.

The question of the grading of assistants holding appointments under local authorities was raised by Mr. Gofton, and was remitted to the Appointments Committee for consideration and report.

The Secretary read a letter from the National Association of Local Government Officers in reference to the Association's communication regarding whole-time veterinary appointments, in which letter from N.A.L.G.O. it was stated that the Society of Veterinary Officers were considering the question of applying for representation on the Standing Joint Committee of N.A.L.G.O. That Association desired to be informed whether they were correct in assuming that the Society of Veterinary Officers was the body most fitting to represent local government veterinary officers on their Standing Joint Committee.

After discussion it was agreed that this matter be remitted, for consideration and report, to a joint meeting of the Appointments Committee, and the Veterinary Officers and Public Health Committee.

Sectional Meeting on the Eradication of Bovine Tuberculosis

At this stage, Captain A. W. Noel Pillers requested to be allowed to make a statement concerning the discussion on Major Douglas's paper by the Public Health Section of Congress.

The Chairman having intimated assent, Captain Pillers said: At the discussion on Major Douglas's paper this morning I was asked to bring two points before you. One was a suggestion that the Economic Advisory Council Committee's Report ought to have been discussed. There was rather a strong feeling that, in view of the fact that that report had been published, we, the National Veterinary Medical Association, were meeting at our first meeting after the issue of the Report and had not discussed it and that it looked as if we were not treating it with the seriousness that the National Veterinary Medical Association ought to have given it. There was a good deal of support for that statement and I promised to place the matter before you this afternoon The other point was raised by two members, with regard to a ruling of mine. I take it that my ruling will stand, as I was Chairman this morning, but at the same time I would like to tell you the facts of the case. In the opening remarks which Major Douglas made he pointed out that immediately after he had sent in his paper he received a copy of the Economic Advisory Council Committee's Report on Cattle Diseases, and he gave, rightly, some of the contents of it so far as these affected the eradication of tuberculosis. Mr. Male, in opening the discussion, also dealt with the matter, at the end of his paper. I may say that I am fully posted with regard to local atmosphere, and I was most anxious that nothing to disturb the harmony of the meeting should arise, and after Mr. Male had made his few remarks, where there were obviously references to divisions of the profession into different parts, I said these words—and this is a transcript of the statement which I made, and it refers to what Mr. Campbell said at the Annual General Meeting, when I said, on a point of order, that I did not rule out discussion on the Economic Advisory Committee's Report—" Ladies and gentlemen, the paper will now be open for general discussion, and I hope that I, as your Chairman, have been very lenient up till now, but I must tell you that I shall not allow any discussion whatever of divisions of the Veterinary Profession. We are discussing the eradication of tuberculosis by the Veterinary Profession as one profession, and I must ask you to keep to that point." (Applause.)

Following some observations from the Chairman relative to the Report of the Cattle Diseases Committee of the Economic Advisory Council, consideration of the second point raised by Captain Pillers terminated with the following observations made by Professor Craig: I think the only question that affects this meeting and that has been raised at the present moment is the question of the position of the Chairman of the Public Health Section (Captain Pillers). We appoint Chairmen to control our meetings of Congress and I think we must allow them to control the discussion. (Hear, hear.) The Chairman decided that a certain point should be ruled out during the course of discussion of a very wide subject, and I think it is a matter for the Council to decide whether the ruling was correct, and in any case I think it is only right, in this particular instance, that we should confirm the ruling of our Chairman.

Council applauded Professor Craig's statement, and the Chairman then declared the meeting closed.

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ANNUAL GENERAL MEETING

Professor J. F. Craig Elected President

MR. BANHAM AND MR. GOFTON HONOURED

The Fifty-Second Annual General Meeting of the National Veterinary Medical Association of Great Britain and Ireland was held at the Royal (Dick) Veterinary College, Edinburgh, at 3 p.m., on Wednesday, August 1st, 1934, the President (Mr. William Nairn) occupying the Chair.

The President was accompanied on the platform by Professor J. F. Craig, Sir John Moore, Capt. A. W. Noel Pillers, the Hon. Secretary (Capt. J. R. Rider), the Hon. Treasurer (Capt. W. G. Wragg), and other Office-bearers of the Association.

The Secretary read the Notice convening the meeting, dated June 30th, 1934.

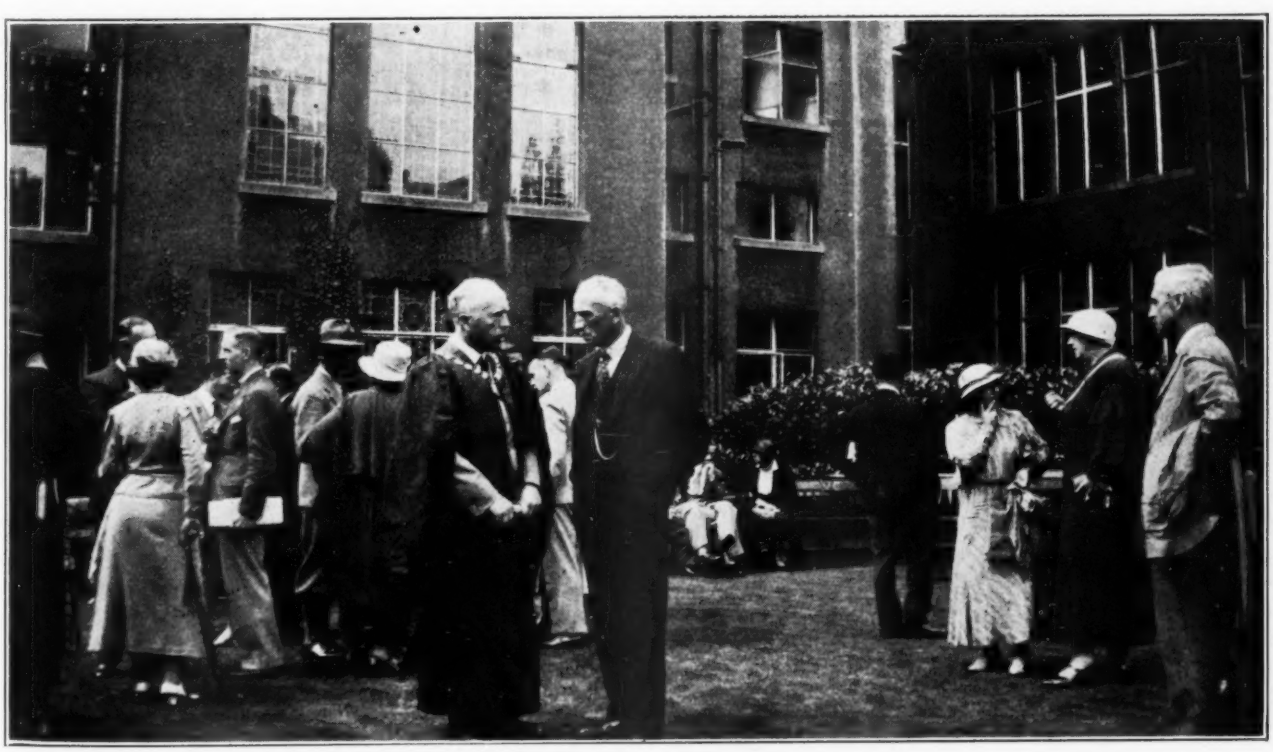
The President: Before we proceed with the other business of the meeting, I would like to take this opportunity of extending a cordial welcome to our delegates. We have a number of delegates from foreign countries, from our Government Departments and from local authorities, and we are delighted to see them amongst us this afternoon and this week, and we hope that while with us they have found interest and pleasure in our Congress and that as a result of their stay in Edinburgh they will be able to take back with them some useful thoughts on their own work in the various departments in which they pursue their activities. (Applause.)

Presidential Address.—Now, ladies and gentlemen (proceeded the President), I come to the stage where the President must inflict upon his audience the thoughts which have grown during his year of office. [The President proceeded to deliver his Presidential Address, which was received with enthusiastic appreciation, and which is reproduced at the commencement of this Special Congress Number of the *Veterinary Record.*]

MEETING PLACE FOR 1935.

The President: The next item on our agenda this afternoon is to decide on the meeting place of next year's Congress. A number of names of places have been submitted by various public bodies and I would ask the Secretary to read out the various names that have been presented.

The Secretary read (1) a letter of invitation from the Town Clerk of Buxton, supported by a letter from Mr. George Howe, M.R.C.V.S., Buxton; (2) a letter of invitation from the North of Ireland Division of the National Veterinary Medical Association, supported by a letter of invitation from the Lord Mayor of



ANNUAL GENERAL MEETING DAY.

Air for the President, Major Spreull and Others.

Belfast and a letter from Queen's University, Belfast, inviting the Association to hold the Congress in Belfast; (3) a renewed invitation by the Borough of Harrogate, conveyed by the Town Clerk on behalf of the Receptions Committee; (4) a circular letter issued by Rhyl Publicity Association, and (5) a letter from the Malvern Development Association.

Mr. H. G. Lamont (Belfast): During the past history of this Association Belfast has never had the honour of being the meeting place of its Annual Congress. For some years now we have felt that we should like to have that honour in Belfast and the matter this year has taken concrete shape. Before issuing this invitation, we approached our colleagues in the Irish Free State, and they have promised their support, so that members of the Congress and of the Association can look upon the invitation as emanating from members of the profession in Ireland. Belfast is an ideal place for the congress. It is very conveniently situated. There is a very good boat service and there is now also an aeroplane service for those who do not like the water. (Laughter.) The hotel accommodation in Belfast is very good, and I can promise you that on the social side we shall endeavour to emulate Edinburgh and, if possible, surpass it. We shall certainly do our best and I promise that, should you decide to honour Belfast, you will have a right royal time. (Applause.)

Major Hamilton Kirk (London): I have great pleasure in seconding that invitation, because Belfast is a seaside place and many of us look upon this Congress week as our holiday. I never did favour inland resorts such as Harrogate, where there is very little for the members to do, and I support Belfast.

Professor J. F. Craig (Dublin): I should like to speak in support of the proposal so ably put forward by Mr. Lamont, that the next Congress of the Association be held in Belfast. I need only add to what has been said that we now have in Belfast Mr. McAllan, who was formerly local secretary to the Congress in Aberdeen, and those of us who were so fortunate as to be present at that Congress, came away with very favourable feelings as to the success of the Congress. I think, therefore, that when we have Mr. McAllan to give his advice in connection with a congress of the kind, success is assured. I know that the profession in Belfast are exceedingly enthusiastic and very desirous that the Association should hold its Congress in Belfast, and I, therefore, ask for the support of the profession throughout the country in selecting Belfast as the place of our next Congress. (Applause.)

The President: Any other proposals?

Lieut.-Colonel J. A. Dixon (Leeds): I would like to suggest that before the meeting commits itself to the Belfast proposition the claims of Harrogate should be considered. I would like to point out that our Annual Congress has been held in Ireland more recently than it has been held in Yorkshire. Harrogate presents every facility for a congress of the kind. I think if my friend Major Kirk spent a week in Harrogate he would find that it is not so denuded of entertainment as he imagines. I am not instructed to say so, but I take the responsibility of saying that the Yorkshire Society and the neighbouring Societies would make the Congress a complete success, professionally and socially, if Harrogate were decided upon. (Applause.)

The President: Does anyone second Harrogate?

Major D. S. Rabagliati (Wakefield): I would like to second Harrogate. I can bear out all that Colonel Dixon has said. Harrogate is a very suitable place for a Congress such as this; the hotel accommodation is excellent and there are a large number of excursions available and pleasant country in the neighbourhood, and I am certain that the Yorkshire Veterinary Medical Society would do all in its power to make the Congress a success. I know that the sea has a very strong attraction for a large number, but I think if an inland place is voted upon, Harrogate should have very strong support. (Applause.)

The President: Any other proposal?

Mr. Tudor Hughes (Oswestry): I would like to support, in a word, the invitation from Belfast. It comes not only from the veterinary profession of the whole of Ireland but also from the Lord Mayor of Belfast and the University.

The President: If there is no other proposal, I will put Belfast as the place of next year's Congress. Those in favour of Belfast? Against. There are only five against. Next year's Congress will be held in Belfast. (Loud applause.)

ELECTION OF PRESIDENT

The President: The next business is to elect the President for 1934-35, and I will ask the Secretary to read the nomination of the Council.

The Secretary: The retiring President proposed the nomination of Professor J. F. Craig for election as President of the Association for the year 1934-35, and it was unanimously agreed to recommend to the Annual General Meeting accordingly. (Prolonged applause.)

The President: I think, ladies and gentlemen, after such a display of enthusiasm, we do not need to submit that to the vote, and I am perfectly sure that you have elected one who will be an ornament to the position. Professor Craig has already held one of the most distinguished positions in the profession and he did so with great credit to himself and to the profession. I just wish him, for next year, a very happy session. (Renewed applause.)

Professor J. F. Craig: I understand, Mr. President, ladies and gentlemen, that it is not

desirable that on the election of a President he should make a speech and all I need say at the moment is to thank you from the bottom of my heart for the very great honour which you have bestowed upon me. I can only hope that the confidence which you have displayed will be justified. It is all the more gratifying to me that you should have elected me unanimously. (Loud applause.)

The PRESIDENT: That concludes our session in public. After ten minutes' adjournment, the members will return for further business.

* * * * *

On the Meeting being resumed:

The SECRETARY said: The following members have written intimating their inability to attend the Annual General Meeting:—

Capt. J. R. Barker, Capt. T. J. Bosworth, Capt. H. S. Cockburn, Capt. J. C. Coleman, Mr. H. W. Dawes, Major A. C. Duncan, Mr. E. P. Edwards, Prof. S. H. Gaiger, Mr. P. J. Howard, Mr. H. C. P. King, Major H. G. Lepper, Mr. J. W. Hall Masheter, Mr. G. T. Matthews, Mr. R. Barons Nelder, Mr. Charles Roberts, Mr. H. L. Roberts, Capt. R. Simpson, Major F. J. Taylor, Major J. H. Taylor, Col. G. K. Walker, Mr. J. Willett, Mr. Wm. Woods, and Prof. G. H. Wooldridge.

ANNUAL REPORT AND BALANCE SHEET

The first business on the resumption was the presentation of the Annual Report and Balance Sheet.

The PRESIDENT: The Annual Report was approved by Council for presentation to the Annual General Meeting, Is it your wish that it be taken as read, and approved? ("Aye.") Those in favour? Carried unanimously. The Balance Sheet was also approved by the Council. I will ask the Secretary to read the certificate of the Auditors.

The SECRETARY: "We have to report to the members that we have audited the Balance Sheet of the National Veterinary Medical Association of Great Britain and Ireland, dated December 31st, 1933, and have obtained all the information and explanations we have required. In our opinion the above Balance Sheet is properly drawn up so as to exhibit a true and correct view of the state of the Association's affairs to the best of our information and explanations given to us and as shown by the books of the Association." Reported by Fairbairn, Wingfield and Wykes, Chartered Accountants, Auditors, 67, Watling Street, London, E.C.4. Dated, June 2nd, 1934.

The PRESIDENT: Is the Balance Sheet approved? ("Aye.") Carried unanimously.

ELECTION OF OTHER OFFICERS

Vice-Presidents.—The PRESIDENT: The next item is the election of four Vice-Presidents, and I ask the Secretary to read the recommendations of Council.

The SECRETARY read the nominations of Council, which were as follows:

For England and Wales (North), Capt. R. Simpson. For England and Wales (South), Mr. W. D. Rees. For Scotland, Major J. G. McGregor. For Ireland, Mr. P. F. Dolan.

The PRESIDENT: I move these nominations.

Mr. TUDOR HUGHES: Before we proceed to the election—and I speak entirely impersonally—I should like to ask whether there are any rules and regulations embodied in our bye-laws governing the election of vice-presidents, because it seems to me that we may be losing continuity in changing the vice-presidents annually, as it is from their ranks that we ought to be looking for those who are well-fitted to fill the highest office that the Association has to bestow. (Hear, hear and applause.) It seriously occurs to my mind, looking at it from the point of view of the Association, whether it is to its advantage to lose the services of well-tried, true and trusty men who have devoted themselves to its interests over a long period of years, and I should like to know whether any bye-laws govern the situation with regard to continuity through the office of vice-president and whether any body or association has so many vice-presidents as we have.

The PRESIDENT: The only rule on the question is the following: "There shall be four vice-presidents, one from each branch of the Association."

Major McGREGOR: I feel deeply sensitive of the honour which the Council has done me in nominating me as Vice-President for Scotland, but I would like to point out that it is just a year ago since I demitted office as Vice-President and I think it is only right that the honour should go round. For my part, I do not propose to accept the honour, as I think that in Scotland there must be someone else fit to hold it and I do not think it is right to appoint me a second time. I might add, Mr. President, that in our Scottish Branch I raised the matter and suggested that the President of the Scottish Branch should automatically become Vice-President representing Scotland. I tried to get that carried, but failed. I think it is only right that the President of the Scottish Branch should be the Vice-President representing Scotland, and I think our bye-laws require reconsideration, but I am quite determined that the honour should go round and that somebody else should be elected for Scotland.

The PRESIDENT: As the nominee of the Council for Scotland has asked that his name be withdrawn, perhaps someone will move another name.

A MEMBER: Mr. President, may I nominate the President of the Scottish Branch, Mr. Duncan Cumming, whose name was also submitted to the Council?

ANOTHER MEMBER: I second that.

Major Kirk: When I made the recommendation of the names this morning I did so because I felt it was useless to continue a man's name year after year if he was not going to be chosen as President, and there seems to be nothing in our Articles that binds us to take our President from the Vice-Presidents, but in any case, let him be a man who could fill the office of President, if necessary. I think Mr. Cumming has been on for three years. If that is so, he is obstructing somebody else who ought to have, as Major McGregor says, the chance of having the honour.

Major McGregor: Mr. Cumming has only been on one year.

Major Kirk: One year! I am sorry. I believe in other cases there have been men on for more than one year.

Major McGregor: Yes.

Major Kirk: Very good. Then the honour should go round, as you say.

The President: Any other nomination for Scotland? Then I put the four names that have been submitted for your approval.

The Secretary read the nominations, as amended by the Annual General Meeting, and on a show of hands being taken the nominees were unanimously elected.

The President: We now come to the election of the Honorary Treasurer, and I have pleasure from the Chair in moving the re-election of our Honorary Treasurer, Captain Wragg. (Applause.) I also have the great privilege of moving the re-election of our Honorary Secretary, Captain Rider (further applause), and I take a like privilege with regard to our General Secretary, Mr. Knight. (Applause.) The Editorial Representative was re-appointed by the Council. (Applause.) The Council also recommend the same Auditors as last year, and I have to inform you that the Council re-appointed Mr. Langley as our solicitor.

ELECTION OF HONORARY MEMBERS.

The President: Now that we have settled all these re-elections, I come to a most pleasing part of our proceedings. It is fitting that an Association such as ours, which has enjoyed privileges and honours from the labour and activities of its members, should, of itself, show that appreciation of their good work, and the Council, at its last meeting, decided to recommend to this meeting the addition of two names to our list of Honorary Members. The names are those of two members who have given distinguished service to the "National." One of them has a remarkable connection with our Association, in that 53 years ago he was the first Secretary of the "National." He has also laid the profession under debt to him because of the useful work of which he is the Editor and with which, I suppose, most of you are familiar—Banham's Posology. These duties, of course, are now shared by another member of our Association, but I think most practitioners in their early days have been most indebted to Mr. George Banham. (Applause.)

The other name is that of Mr. Arthur Gofton, Chief Veterinary Officer of the City of Edinburgh. (Loud applause.) He has held many distinguished posts in our profession, but we honour him most because of the strenuous part which he took in the re-organisation of the National Association as we see it to-day. He did a considerable amount of work on that occasion and it is fitting that we should show our approval and our appreciation of it by adding his name to the distinguished list of Honorary Members that we possess.

Mr. Banham, unfortunately, is unable to be present, but it is not surprising, in one of his years, that he is unable to come so far North, and, therefore, *in absentia*, I would move that we confer the honour of Honorary Membership upon him. (Applause.) I am sure you would wish me to add that it is our fervent hope that he will be spared for many years to enjoy good health and happiness, and the congratulations and good wishes of his friends. (Renewed applause.)

I have now to confer a similar honour on Mr. Arthur Gofton. (Applause.) Mr. Arthur Gofton, you have been elected by the unanimous vote of the members of the Annual General Meeting, as is now recorded here, to one of the highest honours within our power to confer, and I am sure everyone admits that you are an eminently worthy person to attain that honour. I need not recapitulate your distinguished services to the profession; they are too well known. I would merely wish you long life and happiness, and further successes. (Applause.)

The President conferred upon Mr. Arthur Gofton the distinction of Honorary Membership, and presented to him the appropriate Certificate.

Mr. Arthur Gofton: Mr. President and gentlemen, I can hardly find words with which to express my thanks for and appreciation of the honour which you have conferred upon me, and if I respond inadequately, you will please understand that it is because I cannot find suitable words to do so. I will only say "Thank you." One is taught, in one's young days, to cast one's bread upon the waters, and when I undertook the work of Secretary of the Re-organisation Committee of the Association, I little thought that I was then casting my bread upon the waters and that it was to come home as a harvest in this form. At all events, the work was done gladly. Although strenuous, it entailed a great deal of pleasure and brought me into association with many members of my profession whom, otherwise, I would not have met, and in that respect at least it brought me

ample compensation. I would just like to say how pleased I am to be associated with my old friend, Mr. George Banham, in the conferring of this honour. His pioneer work in the foundation of the Association has, perhaps, been lost sight of, through lapse of years, but there is no doubt that he played a very, very important part and had a very difficult rôle to fill in the early days of the Association. There was at least one occasion, and possibly more, in the early days, when the National Association threatened to collapse and but for his strenuous attention, along with that of a few of his colleagues, it *would* have collapsed. To him we owe the fact that the nucleus for which he was responsible gradually developed into the Association as we know it to-day, which, I think, is so well established in life that there is no possible chance of it coming to an untimely end. (Loud applause.)

ANY OTHER BUSINESS

The President: No matters have been referred to the Council, so nothing arises under that item. Is there any other competent business?

Lieut.-Colonel Dixon: I am instructed by an officer of the Association that this is the appropriate time to raise a point in connection with the organisation of congresses. I am sure I am expressing the feelings of all the members who have attended this very successful Congress in Edinburgh when I say that the efforts of the Scottish Division have been amply rewarded by the provision of an excellent Congress. There is no complaint whatever about the manner in which we have been provided for. Everything has been done for our comfort, and it is with no feeling of criticism that I wish to offer suggestions which, I think, would tend towards the better arrangement of future congresses. Firstly, I would like to suggest that at future congresses more attention should be paid and more prominence given to questions of a Public Health nature. It has become more common nowadays for local authorities to appoint officers and members of their authorities to attend congresses and I have felt that this year it was not easy to convince local authorities that the proceedings of this Congress were offered as sufficient attraction to them and to their officers, and I think it would be a great improvement if more attention were paid to Public Health matters. In particular, I would like to remind those responsible for the organisation of future congresses that we appear to be losing sight of the question of food inspection. We hear a lot about the milk side, but there is another side to our activities and we are in great danger of that particular side of our work being ignored and ultimately taken from us. We are not free from criticism and attack by other bodies who would like to claim sole right and sole responsibility in the judgment of articles of food, and I think for our own protection we should make a better display of our interest and should let it be publicly known that we are thoroughly interested in the inspection of meat and other commodities. It would also be an improvement, I think—and I speak from recent experience—if the programme of papers to be discussed could be got out a little earlier and if the invitations to attend the Annual Congress could be sent to local authorities earlier in the year. Local authorities are quite used to receiving invitations to attend congresses considerably earlier than the invitation to attend our congress usually comes to them, and I have found that by the time our congress invitation has been received they have already committed themselves to many deputations, and by sending their members to other gatherings our invitation has not received the consideration which it deserved. I feel sure it would tend towards a better attendance at our congress and a better appreciation of our efforts if these little points were attended to. (Applause.)

The President: I would just like to say, in fairness to the Provisional Committee, that it was through no lack of attention to the Public Health Section that they omitted any particular item, but they felt that the eradication of tuberculosis outweighed in importance any other question and that the inclusion of minor questions would tend to limit free and full discussion of that important question. It was solely to provide for a full discussion at this critical period in the history of our work, when eradication of tuberculosis is so frequently before us, that the Provisional Committee decided upon the course they did. With regard to the point that Colonel Dixon has raised, about getting our programme out earlier, we cannot do that until we have the titles of the papers.

Mr. Donald Campbell (Rutherglen): Might I ask a question? At the discussion of Major Douglas's paper this morning, the Chairman ruled out of order any discussion of one particular aspect of the Report by the Cattle Diseases Committee, namely, the exclusion of practitioners from the Eradication Scheme. As that is a recommendation which affects a very large body of members of the Association, I should like to know if the Council are proposing to give the profession at large an opportunity to discuss that Report and that particular aspect of it.

Capt. Noel Pillers: On a point of order, Mr. Chairman, that was not my ruling.

Mr. Campbell: As to that, I hate to appear recalcitrant, but if the Chairman's words had any meaning at all, the meaning they had was that we could not discuss that point in the Scheme of Eradication which says that only whole-time Inspectors should be engaged in the Eradication Scheme. The Chairman's exact

words were that we could not discuss eradication by divisions, within the profession.

Mr. Arthur Gofton: The paper under discussion this morning was Major Douglas's paper on "The Eradication of Tuberculosis", and not the Economic Advisory Committee's Report.

Mr. Campbell: Am I supposed to reply to that? Major Douglas's paper was entitled "The Eradication of Bovine Tuberculosis." If in a discussion we can do nothing but cross the "t's" and dot the "i's" of the title of the paper, the discussion is bound to be very limited indeed. "The Eradication of Tuberculosis" was the title of the paper. (Applause.)

Mr. Steele Bodger (Tamworth): I think Mr. Male was invited by the Committee to discuss the Report.

Professor Boddie (Glasgow): Surely the fact that the meeting this morning fell in with the Chairman's ruling answers all these points.

The President: I might say for the benefit of the gentleman (Mr. Campbell) who has raised the question, that the question is still under consideration by the Council. They are still pursuing the question and it will be possible for Mr. Campbell to submit his motion at any meeting of a Division or Branch.

Mr. Campbell: I am not convinced by the argument behind your statement, Sir, but I accept what you have to say, quite unreservedly. (Applause.)

The President: Any other questions?

Mr. Hugh Begg: There is a suggestion which I would like to put forward. I do not know whether it will appeal to you or not, but I would suggest to the Association that the time is ripe for having a paper, say next year, on "Humanity to Animals." Two days ago, I made some remarks on the cruelties that were inflicted upon newly-born calves, predisposing them to painful, fatal disease, and it does seem to me that while the position of the Association is absolutely sound with regard to cruelty to animals, in prosecutions and things of that sort, members of the profession are too often ranged on the other side—doing their best to show that a man did not intend to show the cruelty to the animal. The public accordingly range us with the people who commit the cruelty—and that is not true of the profession. It does seem to me that we have made such great advancement in the last two decades that next year could produce a paper showing the advancements which we have made in the matter of painless operations and a score of other things that pertain, through use and wont, amongst our animals. If these could be picked out, to show the happenings that are commonplace and in regard to which anyone can succeed, I think it would make a strong appeal to the public at large and would redound to our credit and would bring to us many anti-vivisectionists who regard us as entirely opposed to their propaganda.

The President: I would like from the Chair to second the proposal so well put before us by Mr. Begg. I think we should do something of the kind he suggests. If we took an active part in propaganda of that nature, it would add much to the credit of the profession, and I would throw out the suggestion to next year's Provisional Committee that they should enlist Mr. Begg's services on that question. Any other business? . . . . The Annual General Meeting is adjourned until Friday at 2.30 p.m.

The Local Secretary (right) Puts Everyone So

RENEWAL OF HORSE SHIPMENTS FROM CANADA

Reuter's Ottawa correspondent reports that a shipment of Canadian horses for George Knox, Westerhill, Bishopbriggs, near Glasgow, has proved entirely satisfactory, and the Canadian authorities hope that further shipments will follow.

It is described as the first cargo of its kind since war days, when large numbers of cavalry mounts were bought in the Dominion.

The average weight of the horses was about 1,700 lb., the heaviest being 1,920 lb. Three of them were Clydesdales and the remainder cross-Percherons.

Mr. Knox, in a letter to the Canadian authorities, says he was very pleased with his purchase. He adds that "Judging from the excellent appearance of the horses there should develop a steady demand if Canada can supply them."

The Social Programme

A factor of great appeal to the visitor to Edinburgh, who takes up his temporary abode in or near Princes Street—as the vast majority do—is that the charm of the city lies in the main at its heart. The daily journey from the hotel to the Royal (Dick) Veterinary College, then, involved immediate immersion in the holiday-making atmosphere of the finest thoroughfare in Europe, and made even the most dutiful delegate rejoice that this programme afforded him more time than many have done in recent years to make his own some measure of the wealth of natural and architectural beauty, of the history and romance, facing him on the southern side. And if it were true that the route to the College itself did something to disenchant him, yet the feast of sight-seeing tours and social good things for which he was able to obtain tickets at his journey's end on the Monday morning completely restored his belief that the Scottish capital is the best of all places for a congress.

In reality, however, by that time the social programme already was well launched, thanks to the kindly foresight of Dr. Bradley and his staff in holding an "At Home" on the evening of Sunday, July 29th. At this informal and delightful gathering the very considerable host of early comers was welcomed to Edinburgh with generous refreshment of mind and body. All thoroughly enjoyed the beautiful old songs of the Hebrides rendered by Mrs. Linton, and the rousing contributions, in lighter vein, of Mr. H. E. Harbour.

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THE CIVIC RECEPTION

The welcoming note was continued next evening, when a great company of members and their ladies were the guests of the Corporation of the City of Edinburgh at a Civic Reception in the School of Art, Lauriston Place.

Dancing was the order of the evening, but the hospitality of the citizens was much enjoyed and great appreciation was expressed of the words of welcome with which the City's representative—Bailie W. Kinloch Anderson—addressed the gathering, following the arrival of the procession of Civic dignitaries.

Bailie W. Kinloch Anderson said: It is my very pleasant duty, in acting for our Lord Provost, who very much regrets his inability to be present, to accord to you on his behalf and on behalf of the Magistrates and Town Council a very hearty welcome to our ancient City.

I had the privilege this morning, at the opening of your Congress, to welcome you in a few words, but backed up, as I am now, by my many colleagues, I do so with even greater assurance. (Hear, hear.)

Edinburgh is a city fortunately placed and it is now looked upon as a Congress City, and many and diverse Associations come to confer together here. I think the reason is not far to seek. We have a most historically interesting and attractive city for the stranger to enter and, besides objects of local intesest, we are a good centre for seeing some of the most interesting parts of Scotland.

I particularly welcome you to-night because Edinburgh Town Council has long been connected with Veterinary Science. (Applause.) The Town Council of Edinburgh has, for a long period, had an intimate connection with Veterinary Science. For 40 years, namely, from 1866 until 1906, the Town Council acted as Trustees for the late William Dick, and during that time was responsible for the management of the Royal (Dick) Veterinary College. The College was constituted an incorporated body under the Edinburgh Corporation Act of 1906, with two representatives of the Corporation on its Board of Management, and the Corporation continues to be so represented.

The Corporation was probably the earliest pioneer in the employment of Veterinary Surgeons in its Public Health service, and for over 40 years—since about 1890—has had veterinary surgeons continuously in its full time employment, engaged in the inspection of meat and milk. It may be of interest to you to refer to the fact that the Corporation owns two herds of tuberculin-tested cattle, comprising approximately 200 head, for the production of tubercle-free milk for the patients in its hospitals and institutions, and that it has under consideration at the present moment a proposal to increase, at an early date, the number of dairy cattle on its farms. (Applause.)

Prior to 1914, the N.V.M.A. was a separate entity, having no definite connection with or relation to regional associations. The conception of linking up the National Association with the Regional Association and of making it truly national in character took birth in Edinburgh, the proposal being made by Principal Bradley in his Presidential Address to the Scottish Metropolitan Division. (Applause.) The spade-work which led to the welding of the local Associations with the National Association, as a parent body, was also carried out in Edinburgh, and the N.V.M.A. is now definitely linked up with 26 local associations and divisions and has affiliation with dominion and colonial associations as widely spread as New Zealand, Malay States, Kenya and Canada. The broader foundation has naturally enormously increased the influence of the N.V.M.A. in the promotion and advancement of Veterinary Science, and in protecting the interests of its members in connection with legislation and other matters.

In closing, let me again assure you that we are delighted to have you with us in Edinburgh. I have had the pleasure of seeing your programme and I find that it is a varied and interesting one, and that besides instructional work during the week you have not overlooked the recreational side. I was very interested to observe in the June number of your journal a most illuminating article on Edinburgh, and I would thoroughly recommend the delegates here who have not yet read, and carefully read, that article to do so to-night, so as to prepare themselves for some of the things which they may see while they are in residence with us. I welcome you to Edinburgh and to this Reception, on behalf of the Lord Provost and the Corporation of the City of Edinburgh. (Loud applause.)

The President: Bailie Kinloch Anderson, I can assure you that it is with very sincere pleasure that the Members of the National Association come here to enjoy the hospitality of the City of Edinburgh. We remember, with considerable appreciation, what we owe to your City, Sir, in the past, and it is with specially warm regard on my own part that I remember that during my training in the Dick Veterinary College your City Council subsidised that College sufficiently to enable it to carry on in very difficult years. But your interest in our profession did not end with supporting our Veterinary College, which support, I understand, still continues. You took a leading part in appointing a Veterinary Officer to your Public Health Department, and we appreciate very highly your recognition of our profession on that occasion. You referred, Sir, in your remarks, to the part played by Dr. Bradley, Principal of the Dick College, in re-organising our National Association, and the National Association recognises the great work which he did on its behalf. We conferred upon him last year, at our Annual Congress, as an indication of our appreciation of his services, the Diploma of honorary membership, and I would let you know, now, that this year, at our Congress in Edinburgh, it is the intention of our National Association to confer a similar honour upon your Veterinary Officer, Mr. Gofton. (Hear, hear, and applause.) He also has done excellent service on behalf of our Association and we do not like to forget the services of our distinguished friends. I need not delay this function further, but, before closing, I would like to thank the City Council of Edinburgh for their hospitality to our National Association, and would specially like to thank Bailie Kinloch Anderson, because he has devoted the greater part of this day to our pleasure, and I am sure we owe him a very hearty vote of thanks for that alone. I would ask you, ladies and gentlemen, to accord him a very hearty vote of thanks. (Loud applause.)

Bailie Kinloch Anderson: I would in a word, just thank Mr. Nairn for his kind proposal of a vote of thanks to myself. I might almost say that I have a personal link with the Veterinary Profession, in that my father, in the old days of the Dick Veterinary College, was one of its Trustees and served upon its Board of Management for a long period. (Applause.)

It also gives me particular pleasure to welcome you here to Edinburgh College of Art, because I happen to be, nominally, the Chairman of the College of Art, and I feel that I am welcoming you to my own home, here. (Hear, hear, and applause.) Now, ladies and gentlemen, dancing will begin forthwith and refreshments will be found in some of the rooms round about. I sincerely trust that you will have a very enjoyable evening and will go away with a fine impression of the hospitality of the City of Edinburgh, as extended to you in its College of Art. (Loud applause.)

A most enjoyable programme of dance music was provided by Ted Maconachie and his "Serenaders."

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THE PRESIDENT'S RECEPTION

In consequence of the holding of the Civic Reception on the previous evening, Congress may be said to have been at its height when, on the evening of Tuesday, July 31st, the President and Mrs. Nairn received the members and their ladies in the Freemasons' Hall. Here was the first clear indication that the 1934 Congress of the Association would gain the coveted distinction of creating an attendance record—as was subsequently proved conclusively by the Official Congress Register. No fewer than 327 guests attended to pay their tribute of affectionate esteem to the President and his lady, who were obviously both touched and gratified by the knowledge that they were the centre of a demonstration of a more representative nature than any hitherto accorded the titular head of the Association. The great company spent a most enjoyable evening, the occasion admirably fulfilling its now time-honoured purpose of enhancing the social atmosphere of the Conference. The excellent dance floor was occupied "into the early hours," and a highly appreciated feature was the performance of a set eightsome reel by members of the Scottish Pipers' Society and of a set foursome, both arranged by Dr. Simpson, of Gracemount. The enjoyment of the gathering was also much enhanced by the beautiful rendering of Scottish songs by Miss Dorothy King (soprano), and Mr. John Thorburn (baritone), with Mr. George Short at the piano.

THE ANNUAL BANQUET

Presentation of the Dalrymple-Champneys Prize

On Wednesday evening, August 1st, the Annual Banquet of the Association was held within the Freemasons' Hall, George Street, Edinburgh, the President (Mr. William Nairn) presiding over a company of approximately 300 members and guests.

A very enjoyable dinner, during the course of which the Scottish Haggis was piped in with due honour, preceded the Toast List, and the company thereafter adjourned to the ball room and engaged in dancing for a few hours.

Miss Veda Vallance, contralto, Mr. Albert Dewar, tenor, and Mr. George Short, accompanist, entertained the company at intervals throughout the evening with songs mainly of Scottish origin.

The Toast of " The City of Edinburgh " was submitted by Dr. J. Russell Greig, in the following terms :

It has been given to me to propose the toast of the City of Edinburgh. Had I been a comparative stranger to this City, I can conceive that this task would have been easy—even pleasant ; but to me who was born and reared and educated in this City, who have found my life work in it and, more than that, who find in it every new day a quality—a something—that is above mere admiration and esteem—for me who am so closely bound to the City, this task is a difficulty, even an embarrassment.

In approaching it, my feelings are such as I conceive my feelings might well be if, upon some future public occasion, I should be required to propose the toast of—my own wife.

I remember a lord provost of Edinburgh once saying that during his term of office, he had replied to the toast of the City of Edinburgh on 272 occasions. On 270 of these occasions, he believed he had done so in a befitting manner, but on two of these occasions, he could do no more than mutter a few incoherent disjointed sentences before sitting down in utter confusion. He explained that on these two occasions, and only on these two occasions, the proposers of the toast made no reference to Edinburgh as the most beautiful city in the world.

I trust that my friend, Baillie Kinloch Anderson, is not, in temperament, constituted similarly to that lord provost, because I intend tonight to make no reference to the fact that Edinburgh *is* the most beautiful city in the world. (Laughter.)

In proposing the toast of a city, I am informed that it is proper to begin at the beginning of its history and work systematically through the ages until one arrives at the present day. I would, therefore, ask you to cast your minds back a long, long while ago—to that time to which geologists refer as the " Early Carboniferous Period." Now, in the Early Carboniferous Period the Earth was undergoing a series of violent internal cataclysmic down and upheavals. Those of you whose intention it is to cross the Atlantic Ocean within the next few days, may, in your imaginations, have glimpsed something of what geologists attempt to describe ! (Laughter.) These violent symptoms fulminated in as violent volcanic eruptions, and in this place these eruptions upflung great masses of very hot and bothered rock and lava. Then there came a time when all this was dipped beneath the sea, and a later time—a few æons or so later—when it arose again from the waters and, still later, came the great Ice Ages ; and these various processes cooled and calmed and chiselled things down again. And valleys were scooped out between the masses of rock, and the land fell gradually away to the northward, down into the sea.

But we must pass on ; and here we are in the middle of the Eleventh Century, and we meet a savage King of Scots. His name is Malcolm and, because of his big head, he is called Malcolm Canmore—he must not be confused with another national hero who flourished at a much later period, Malcolm Campbell. Just about this time there was a Norman adventurer named William, and this William the Norman adventured so successfully that he crossed the Channel, beat the Saxons at a place called Hastings, slew Harold, the King of the Saxons, and put the court to flight northwards. You will note *northwards :* this is of vital importance. They fled north until they came to Scotland, when they threw themselves upon the hospitality of Malcolm. What the Scottish Malcolm thought about this influx upon him and all that it imposed upon his hospitality, history—mercifully—makes no record. But among the court there was a beautiful princess named Margaret, and when Margaret threw herself on Malcolm's hospitality, he raised no objection whatever : he even went so far as to make her his queen, and in doing so, I had almost said, he made Edinburgh.

She introduced the refinements of the Saxon court, and not only refinements in the manner of living, but she introduced books and a love of learning—rudimentary though that may then have been. There is a very beautiful picture by, I think, Noel Paton—certainly some Pre-Raphaelite—which shows the gentle Margaret reading to her unlettered King, the doting yet ruffianly Malcolm. He listens intently, enthralled by the wonder of the world-images she makes to live out of the scrivened page.

The Queen and all her works were beloved—aye, worshipped—not only by Malcolm but by all about her. Eventually she was canonised as Saint Margaret of Scotland—she that was the woman of the Sassenach !

And these two sets of happenings, so widely

apart from each other both in respect of time and of character—these happenings, I say, gave Edinburgh her heritage. On the one hand, the fierce, unrestrainable forces of nature that gave her her everlasting, her imperishable hills, upon which she was set enthroned in incomparable beauty and, on the other hand, the imperishable memory of a gentle, finely-minded woman that set her, not upon hills, but upon her path of learning, and of culture.

These things, Beauty and Learning and Culture ; but I would add a fourth ; that which linked Malcolm to his Margaret—Romance !

Edinburgh ! These—Beauty and Learning and Culture and Romance. These things are she ! (Cheers.)

Baillie W. Kinloch Anderson who, in the absence of the Lord Provost, was called upon to reply, said : I would like to say, in opening, that I am beginning to feel very much at home in the company in which I find myself to-night. (Hear, hear.) I had the pleasure on Monday morning, at your opening session, to extend a civic welcome to you. On Monday evening, I had the pleasure, as representing the Lord Provost of the City, who very much regrets that he is unable to be with you, to extend a more formal welcome to you at our function in the Art College. On Tuesday evening, last evening, I had the pleasure to be in your company and to enjoy your company—and, incidentally, the dancing—and to-night, again, Mr. Chairman, I find that I am in your indebtedness and am again with you as your guest. On Monday night, when I met Dr. Russell Greig at the Art College, he rather frightened me in regard to the speech which he has delivered to-night. He told me that he was beginning at the dark ages and was going to work up to the present date, but I am truly thankful that whatever he has said about what is past in the City of Edinburgh, he has not yet reached the deeds—or misdeeds, it may be—of the present generation.

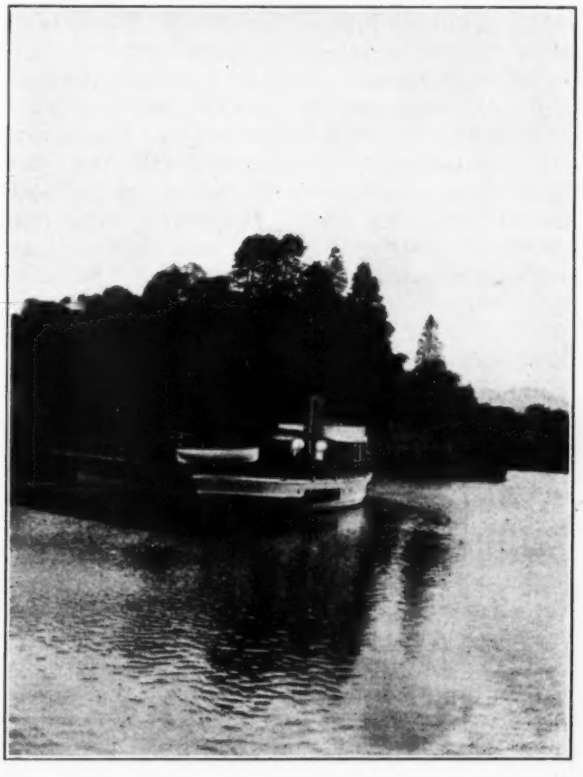
I would like to express the hope that while you are with us in Scotland, particularly those of you who come from over the Border, you will get the opportunity to catch a glimpse of some of our Highland hills and, if possible, the islands. If you cannot do that, then go up to the Castle on any fine, clear day—particularly a day when the North wind is blowing—and you will see, almost at your feet, the Firth of Forth with the Port of Leith contiguous to the main City ; to the Eastward you will observe the Bass Rock and North Berwick Law ; to the Northward and slightly to the Westward, that wonderful range of hills, the Ochil hills, with its famous monument to the patriot Wallace, at Stirling, and further to the North you will see the lower slopes of the Grampion hills, while to the Westward Ben Ledi and Ben Vorlich can be observed. Further West Ben Lomond, rising sharply from the bonnie, bonnie banks of Loch Lomond, raises its lordly peak. Edinburgh has much to show you, and I trust that besides the local attractions you will see some of the places I have mentioned. I observe from your programme that some members of your party are engaging in golf competitions in or around the City and I hope that those of you who have come from the South will have the opportunity to see some of what I might term the hinterland in our immediate vicinity. Well, ladies and gentlemen, I do not think I have got any closer to the real toast of the City of Edinburgh than the proposer of the toast himself did—(laughter)—but I would just like to say, in closing, that I greatly appreciate the honour which you have done my wife and I by asking us here, to represent the City, to-night. I want again to assure you, as I endeavoured to do on Monday night, of our great pleasure in having your important conference in our midst. (Loud cheers.)

"THE NATIONAL VETERINARY MEDICAL ASSOCIATION OF GREAT BRITAIN AND IRELAND"

Mr. G. S. Mercer, in submitting this Toast, said : I feel it a very high honour indeed to be asked to propose this important toast on this auspicious occasion. I have the feeling that I should hardly have been asked to do it, because—I will let you into a secret right away—if I had the opportunity in the future of choosing again my business in life I should never choose that which you gentlemen follow. (Laughter.) There is a saying here in Scotland—and perhaps it pertains in the other parts of the Kingdom, too—that one man's meat is another man's poison. I am very sorry indeed that your profession is not palatable to me, but it must be exceedingly palatable to most of you, and for that I am truly thankful. I am just sorry that my own feelings on the matter are as they are, but I think they compel me to admire you all the more for adorning the profession which you have chosen. (Hear, hear and applause.) But there are two respects in which I think I am perhaps suitable for proposing this toast. The one is that I am a farmer, and I think if ever two professions—if I may call farming a profession : perhaps I shouldn't—were linked together and yet independent, I think agriculture and veterinary science go together. (Hear, hear.) The other reason is that I am deeply interested in research into animal diseases and that, after all, gentlemen, is a most important thing in so far as your profession is concerned. (Hear, hear.) A great many people are apt to think that the veterinary profession is a profession of yesterday. That is not true. It dates away back into the dim past—to those early days when large doses of salt or treacle, profuse

blood-letting, and even the drastic fire-irons were both prescribed and practised by farriers. We wonder why farriers were chosen for that job. I think there is a perfectly simple explanation. At that time animal life was of very little value. The population was sparse and money was scarce, and animal life was thought little of, and if they could not have got the farrier—who was not dependent on that work for his living—to come and visit their sick horses and cattle (the sheep were never considered in those days) there would have been no attention given to the animals. I think in those days even poorer skill than the farrier's would have done, but we are glad to say those days are all past now. The veterinary profession is coming into its own, and that because the value of animal life in the farm has definitely appreciated. It has appreciated both commercially and from the point of view of humanitarianism. We see the commercial appreciation in the fact that in recent years we have seen individual horses and cattle sell for many thousands of pounds, and sheep running into hundreds. These appreciated prices have given your profession its opportunity, and I am glad to say your profession has made the most of its opportunity. (Hear, hear.) The added value of our animals demands that better care should be taken of them, and you, gentlemen, are helping us to do that.

It is rather interesting to consider how veterinary education has advanced in these latter years. It is not so very long ago since the first college in veterinary science was founded in Scotland. I have not studied the English origins and I cannot speak so much about them, but I do know and appreciate the determination and the enthusiasm and grit that led to the foundation of the first veterinary college in Scotland. (Hear, hear and applause.) In those days I have no doubt Scotland was a good long way behind England—and possibly behind Ireland, too: I cannot say—but by the tremendous advance which we in Scotland have made during the last 20 years I am convinced that if our Southern friends are now holding their own with us, they are doing very well indeed. (Applause.) I have always thought that it required great skill on the part of a veterinary surgeon to do his work well. One is inclined to contrast the position of a veterinary surgeon with that of a family physician, and when we think of that, the veterinary surgeon is seen to be labouring under serious disadvantages, because we must remember that his patients are dumb creatures, but is it such a disadvantage after all? (Laughter.) I do not know that it is, and I am sure that there is many a physician to-day who would willingly take your poor dumb creature in exchange for the loquacious one that he has to deal with. (Laughter.) I am sure that when



There were Counter-attractions to the Set Programme at Edinburgh.

we imagine the thoughts of these physicians when they are dealing with their garrulous patients we must be thankful that those thoughts are not expressed in words.

I have read the objects of your Association, as they are printed, and I notice that your first Object is the Promotion and Advancement of the Veterinary and Allied Sciences and the maintenance of the honour and interests of the Veterinary Profession. I would congratulate you, gentlemen, both on the word and the order of that phrase. I am glad you are looking after the honour and interest of your profession. These are sacred things and they have to be looked after, but I am also glad that you put first the promotion and advancement of veterinary and allied sciences. (Hear, hear.) I am confident of this, that the best work we do is not the work which we do from a selfish motive but the work which we do from the broad point of view of helping others, and I am convinced that your Association has that broad view. I do not know many of you, but I should think, from looking around the tables to-night, that I am correct in saying that you have that spirit very largely in you. But, gentlemen, I have known two members of your profession very well indeed, and if I judge the profession by them, then I have no hesitation in saying that what I have announced is a perfect truth. The first of these gentlemen was the veterinary surgeon who gave his services to my father and then to myself for almost half a century. I think, from what I have learned, that his degree must have been taken just immediately after the veterinary degree was conferred for the first time, and I am proud to say that the man upheld the honour of the profession as well and ably as any man I have ever come across. (Hear, hear and applause.) He was interested in his work, and although his degree was taken 50 years ago, up to the very end, a few years ago, when he died, he was keeping himself abreast of the veterinary thought of the day, and it was interesting to me to watch how his methods in dealing with the same disease changed time and again as the years went on. I honour his memory, and I feel that he was a real adornment to your profession. The other gentleman I wish to name. I do not know whether he will like it or not, but I am not going to consider his feelings too much. The other gentleman is the President, who is in the Chair to-night—Mr. Nairn. (Loud cheers.) I feel singularly glad that I am here to speak a word on his behalf because I have known Mr. Nairn since he was a very small boy, and as a boy I thought a lot of him, and as he grew up to manhood I respected him, and that respect has steadily increased as the years went on. I just wish to-day that his worthy father, whom I knew very well, too, and who was a man of exceedingly good brain, had been here to see the honour which his son is enjoying this year, but I am glad that his mother, at least, has lived to see it. (Applause.)

I said, earlier, that I was deeply interested in research into animal diseases, and I am (and since almost the beginning I have been) Vice-President of the institute which you visited on Monday, at Moredun. It has been a great delight to me to help forward that work, because I know that it is a great work and a necessary one. We in the Animal Diseases Research Association have felt all along how much we needed the help of the veterinary profession, and I know how very well we have been supported throughout by the veterinary profession and by no one more so than your President, Mr. Nairn. (Applause.) It is astonishing how he has managed to give the time that he has given to his work, because he is a man with very many interests and he puts his best into them all.

In giving you the toast of The National Veterinary Medical Association of Great Britain and Ireland, I wish it well. I think there is a great future before that Association, and I am sure it will be able to enter into the field of opportunity and achieve what it is its duty to achieve. I give you the toast, and I couple with it the name of Mr. Nairn. (Applause.)

The company loyally honoured the toast and joined in greeting the President, in song, as "A Jolly Good Fellow."

The President: Last night you had disclosures about my early life, and after the latest disclosure, I think it is almost time I left the Presidential Chair. I should like to thank my friend, Mr. Mercer, for his beautiful and touching tribute to my parents. I think it was thoroughly deserved by them, and I only hope to be worthy of them. Mr. Mercer has also paid a splendid tribute to our professional work, and I thought, as he spoke, that his Toast might almost be taken as the reply. I could hardly add much more or wish to change anything that he said. His whole speech was complimentary to our work. He envisaged the change of outlook in regard to animal diseases that is taking place in our profession every day. (Hear, hear.) Research has become more active within the last 20 years and the results of that research must have a big effect on our professional work. As Mr. Mercer told you, the old days when the principal interest of our labours was the administration of medicine, in attempts to cure disease, our work was naturally narrow and circumscribed, but when we realise more thoroughly the cause of disease, we appreciate more fully more adequate means of dealing with these diseases, and we will certainly be able by these means to do much more for the benefit of the country. I would say that the pathway along which our

profession must advance is the road of self-destruction. That may seem rather a paradoxical statement to make, but whereas in the past we have earned our money by curing disease, we are now going to remove the disease, and although it would appear that by doing so we would destroy our success in income, I think only the pessimist would take that view of progress. I have not the slightest fear that although we go on removing diseases from our list in the years that lie ahead, there will still be plenty of work and more pleasant and more worthy work for our profession. (Hear, hear and applause.) Mr. Mercer hinted at the same idea—and I would just reiterate the observation which he made—but I would take a quotation from the Scriptures and say that we should cast our bread upon the waters and we can have every confidence that it will return to us within a few days. I am speaking from my experience of life, when I say that the services that have brought me the greatest reward in pleasure and in honour and in profit have been the services which I gave without thought of reward, and I think we might do well to turn our minds to the wider aspects of medicine and see that we labour not for ourselves but for the nation. (Hear, hear and applause.) The great problem that presents itself to our professional interest at present is the eradication of tuberculosis. That has been forced upon us by the realisation that that disease is a scourge to mankind and a scourge which, in the light of our knowledge to-day could be removed, and if such be the case, it is a very great cause for sorrow that we should tolerate it any longer. I would assure our visitors here that the veterinary profession is perfectly competent to deal with that disease, but they must not expect it to be eradicated within five years. It will take a considerable period to do that, but there is no doubt about the final result in that respect, if we are given the proper means to that end and full opportunity. The night, ladies and gentlemen, is wearing on, and I feel that I am detaining you too long, and I would just like to thank my good friend, Mr. Mercer, for the delightful way in which he has proposed this toast and also thank the ladies and gentlemen in front of me for receiving it with such fervour and enthusiasm. (Loud cheers.)

"THE GUESTS"

Capt. A. W. Noel Pillers, in proposing, observed: On several occasions, I have had an ordeal similar to this, to propose a toast, and you have had a similar ordeal, to listen to me. On these occasions I have been surrounded by a number of Scots who have practically told me everything I was to say, and what I said was a great success, but to-night I am not in that fortunate position. Just before I came here, however, I wanted to gather a few notes and I said to an eminent general practitioner from the district of Tamworth, "Can you give me a few heads that I might use with advantage and pleasure to the guests this evening?" He was rather abrupt. He said, "Well, I don't care what you say, but I hope they will rule you out of order." (Loud laughter.) Now, our guests who are here must have noticed at the various functions which they have attended that we are, at least, a unique and peculiar profession. (Laughter.) We have a motto which, even at this late hour, I propose to try and say—(laughter)—and it is "Vis Unita Fortior"—and we forthwith gather together and start to pull each other to bits—(laughter)—but although we differ on those papers, we are absolutely unanimous when it comes to the question of our guests. That is about the only thing I know upon which the National Veterinary Medical Association is unanimous. (Laughter.) We invite guests to our gathering with no ulterior motives. We invite them and we want them to come and enjoy themselves. I think I might go further and say that we want our guests to be our friends. We have a number of very distinguished guests with us to-night, and I have been instructed that, in order not to call forth any discomfort in any way, I am not to go into detail in regard to them but am just to say that they include distinguished members from medicine, science and agriculture. We hope that they have enjoyed our social gatherings, and we hope that those who have been to any of our "scraps" have enjoyed these just as well. I can certainly say that certain of the guests have enjoyed themselves very much. I will not detain you any longer, at this late hour, but would just say that we, the National Veterinary Medical Association of Great Britain and Ireland, hope that our guests have enjoyed themselves and that if we invite them to come again they will look forward to it and will come. I have the greatest possible pleasure in proposing the toast of Our Guests, and I couple with it the name of Professor Mackie. (Cheers.)

Professor T. J. Mackie, who responded, said: I feel that you have placed upon me a very weighty responsibility because in the list of your guests I find representatives of the Town Council of our capital city; representatives of three great Government Departments; representatives of the Royal (Dick) College, and the Governing Board of that College; of the Highland and Agricultural Society; of the Animal Diseases Research Association, and I find amongst my constituents—and as you can see it is a very varied constituency—two distinguished ladies. Without consulting my fellow guests, Mr. President, there is one sentiment which I know I can express with the utmost confidence and with the greatest emphasis, and that is our very grateful thanks to you and your colleagues for the bounteous hospitality which you have

offered us to-night. (Applause.) I would also like to thank you for the honour which you have done us in inviting us to take part in this very interesting meeting of your Association in our City of Edinburgh. I would especially like to thank Mr. Noel Pillers for the very kind-hearted way in which he has rather skimmed over our qualities and our disqualifications. I think he has let us down very lightly indeed—especially, perhaps, the Government Departments that are represented here to-night, because I know that these great Government Departments are always fit game for oratorical sport upon such an occasion. (Laughter.) I am sure my fellow guests appreciate very much indeed the compliment which Mr. Pillers paid to us, and if he thinks we have any good qualities, I know my fellow-guests would like me to make some very modest disclaimer, but, if I would except myself, I think your guests to-night are all men of whom a very high statement could be made regarding their qualifications and good qualities.

I cannot speak for all the activities and interests that are represented by your guests here to-night, but I would like to take this opportunity, if you will permit me, to say something on behalf of three bodies to which I am connected and with which you have some relationship. One is the Agricultural Research Council, the second is the Research Committee of the Animal Diseases Research Association, and the third is the Medical School of our University of Edinburgh. The Agricultural Research Council, I think I can say, is very deeply interested in your profession and particularly in the advancement of your branch of science. I think it is no secret to say that when the Council was first instituted it was laid down, practically as a matter of fundamental policy, that the Council should do its utmost to assist in the advancement of veterinary science, and we came to the conclusion that veterinary education was the spearhead of the attack. If you will allow me to mix my metaphors, I think one can say that amongst the various branches of higher education that have received State Aid, veterinary education has been too long the Cinderella, and we do hope that within a short time veterinary education will be placed on a par with the Universities; not only so, but that it will be recognised as a necessary educational institution and be financed accordingly. I consider it a great honour to be a member of the Committee of the Animal Diseases Research Association but a greater honour still to be at the present time Chairman of that Committee, because I feel that that Association personifies all the scientific enterprise of the Scottish farmer. That Association may well be proud of the splendid organisation that has been built up here for research work and of the splendid work which that organisation is carrying out. I think it says a great deal indeed for the disciplinary outlook of the Association that it is shortly to enter into the closest co-operation with the veterinary institute in Edinburgh—the Royal (Dick) Veterinary College—in order to create in Scotland a still more effective and bigger research organisation for the study of animal diseases and veterinary science in general.

With regard to the veterinary school here and medicine in general, I would like to see the time come when there will be a much closer relationship between human and animal medicine, both as regards teaching and research work, although, of course, these two branches can always be dissociated in actual practice. I can see no actual dividing line between human and animal medicine. It is true that the average doctor would be of little use in treating an angry bull for some painful ailment, and, conversely, that the veterinary surgeon would find himself considerably embarrassed if he had to handle a human patient who was in similar a state of mind and body—(laughter)—but in the long run, and particularly on the scientific side, there is no dividing line. I have always considered it good fortune, in my line, to find that my subject was in both human and animal medicine, and common to agriculture as a whole, and I would like to say that it has been a very great pleasure to me, in the University, to teach the veterinary student in the same department as the medical. I only wish that one could teach them in the same class, for the advantage of both. As regards agriculture in general, if you will permit me to make one observation, I once heard an eminent medical authority state very emphatically to a body of scientific agriculturalists that agriculture was merely a branch of medicine. They asked him, with some indignation, to explain that extraordinary statement, and he remarked as follows: "Well, isn't the main purpose of agriculture human nutrition, and isn't human nutrition a branch of medicine?" I would like to broaden that idea by saying that the main purpose of agriculture as one sees it just now in our country, is animal treatment, animal nutrition and, in turn, human nutrition, and these three subjects constitute, as far as I can see, simply a branch of medicine both animal and human. I notice that your Association has, as one of the emblems on its coat of arms, the figure of a centaur. I think you might take the centaur as symbolical of the first biological relationship between man and domesticated animals, and, in turn, of course, the close relationship between human and animal life.

I have wandered a little from the main purpose of my reply, and now, in closing, I must return to my duty by thanking you once again, Mr. President, ladies and gentlemen, for your very kind hospitality, and you, Mr. Pillers, for your very kind compliments, and by wishing your

Association not only all material prosperity in the future but the greatest success in advancing the interests of your profession and also in advancing the science which your profession represents. (Loud cheers.)

Award of Dalrymple-Champneys Prize for Published Work of Outstanding Merit in Scientific Research, Clinical Investigation or Public Health Activity.

The President: Ladies and gentlemen, we come now to an interesting and delightful item in our programme, the award of the Dalrymple-Champneys prize. I dare say my friends around me who saw this beautiful cup in front of me wondered why it was there. They would perhaps think it had been placed there as a present for the President, but his conduct of the duties of the Chair this week would merit something considerably less. (Laughter.) This is the cup presented by Sir Weldon Dalrymple-Champneys and Lady Dalrymple-Champneys to the National Veterinary Medical Association, and you will perhaps allow me to read the inscription which explains why the cup is presented: "Dalrymple-Champneys Cup. Presented by Sir Weldon Dalrymple-Champneys, Baronet, M.D., for published work of outstanding merit in scientific research, clinical investigation or public health activity." I think that clearly explains why Sir Weldon has presented the cup. As you know, Sir Weldon has been a frequent visitor for our congresses and has shown a deep interest in our work, and we very highly appreciate that interest from Sir Weldon. (Loud applause.) Mr. Noel Pillers said that we tried to do our best for our guests and twitted me about a slight slip that I made when I called our guests "visitors," but I think our Association also likes to appreciate its friends and in Sir Weldon we have a very sincere friend and we appreciate his friendship. The prize has this year been awarded by the Committee of the N.V.M.A. appointed for the purpose, to Professor Wright of the London Veterinary College. (Loud cheers.) Professor Wright's work is well known to you all and I need hardly add anything about it, but I should like to say that his work on Anæsthetics and Improved Methods of Anæsthesia and Improved Surgical Technique would cover the work to which he has given his best interest, and the whole profession is indebted to him for the progress which he has made in that section of our study. (Applause.) It is, therefore, with very great pleasure that we take this opportunity of expressing our appreciation of his good work and services to the profession. The cup is kept by Professor Wright for one year, when it may be awarded to some other worthy person in our profession, but along with the cup there is a medal, which is Professor Wright's for all time. Lady Dalrymple-Champneys will present the cup and the medal to Professor Wright. (Applause.)

Lady Dalrymple-Champneys (being greeted with loud applause): When my husband and I went forth to find this cup, we did it with love in our hearts and admiration for this great and distinguished Association. You have given us such wonderfully happy times with you. You have opened your arms to us and made us one of the family, and we will not forget it, and it was just to show a little mark of our appreciation that we went to buy the cup. It may be only a coincidence that we should be presenting the cup bearing our name in the land where our forefathers have made such history. (Applause.) Professor Wright, I hope your cup of happiness will always be as full as this one, and as large, and that your great career will go on to further success for the wonderful profession to which you belong. I have the honour to present to you the Dalrymple-Champneys cup. (Loud applause.)

Professor Wright: I am deeply sensitive of the very great honour which the Association does me in conferring upon me this magnificent award. One is all the more gratified that the Committee selected to adjudicate in this matter should have seen fit to recognise the labours of one engaged in clinical work. (Hear, hear and applause.) As clinicians, we have to obtain our material from animals that are presented to us for treatment and we cannot always follow up closely those postulates which mark scientific work. Very frequently we are unable to even see our cases to a conclusion. The research worker sets himself a problem and follows it with that absolute exactness that exemplifies modern science to-day and produces facts, whereas we, as clinicians, to quote the motto of the Royal Veterinary College, are imperatively ordered to go forward and meet disease, literally, as it comes. The field of veterinary practice to which I have paid most attention has been that of surgery. The veterinarian encounters a number of difficulties in surgery which are not appreciated by his counterpart in medicine. We deal with animals which very naturally fear and frequently greatly resent the slightest interference on our part, and for that reason we have paid very great attention to the subject of anæsthetics, and I feel that as a profession, we should be proud that veterinarians have been very quick to take up any new ideas of anæsthesia and apply them to animal practice. (Hear, hear.) We have frequently to induce general anæsthesia for operations which, in man, could quite successfully be carried out under local anæsthesia, for general anæsthetics are dangerous things. An animal is brought to the borderline between life and death. Its central nervous system is almost completely paralysed. Again, when we are inducing

anæsthesia—and especially anæsthesia by inhalation—the animal does not respond to the gentle voice of the anæsthetist, to breathe deeply and slowly; it resists to its uttermost and because of that our dangers are increased. The British public is, unfortunately, singularly misinformed in regard to anæsthetics. Its source of enlightenment appears to be the writer of detective fiction who evidently imagines that anæsthesia is induced by means of a handkerchief in front of the nose and that the animal very quickly goes to sleep. That is not the case. During recent years, however, there have been introduced a number of remarkably efficient non-volatile anæsthetics which may be administered by simple injection, and it is my firm belief that these will revolutionise small animal surgery. It is not inappropriate, in this great City of Edinburgh—this great centre of medical knowledge—that the subject of anæsthetics should be mentioned, for was it not here that some 70 years ago that great surgeon and anæsthetist, Sir James Young Simpson, introduced chloroform into human science? During the post-War period, I think we have made great advance in surgical technique, especially in small animal surgery. Aseptic surgery in small animal surgery is now an established fact and the healing of animal wounds by aseptic treatment is now the rule rather than the exception. We live in an age of specialisation and with that I am in entire agreement, and I would put forward the plea that we strive to greater efficiency in the particular branches of our profession that we practise.

In that connection I think our schools might well institute post-graduate instruction in clinical work. They are already doing that in medicine and in tropical medicine, and I think they might be well advised to introduce post-graduate instruction in clinical work—and, what is more important, that practitioners should avail themselves of such an opportunity. It has been said by a previous speaker that we live in an age of humanitarianism. Perhaps one should say animalism. We, by the nature of our work, are in constant contact with suffering animals and we, by our knowledge and experience, are the only persons capable of assessing and reducing that suffering, and for that reason one is aggrieved that at any rate in England, such a large proportion of the money so generously contributed toward animal welfare should find its way into channels where personal aggrandisement rather than animal welfare appears to be the main object. (Hear, hear and applause.) Well, ladies and gentlemen, I feel that we are ourselves in part to blame. We have hidden our light under a bushel too long. The British public does not realise, even yet, the capabilities of the veterinary profession, and one is astounded, in the London College, that when we have enlightened medical men visiting us they are absolutely amazed that we can do for animals similar things to those which they do for men. At this point, I would close. The evening is getting on. I would again like to express my deep appreciation to the National Veterinary Medical Association for the very great honour which it has conferred upon me this evening. (Loud applause.)

"THE LADIES"

Mr. Esmond Brown, in an exceedingly witty speech, proposed the toast of The Ladies, and Miss Marion Stewart briefly and humorously replied.

"THE CHAIRMAN"

Mr. G. P. Male, in submitting the concluding Toast, said: I feel rather like the man who, after a very long evening of political speeches, was called upon by the Chairman to give an address. He said, "My address is Blairgowrie, in Scotland, and I'm going home." (Laughter.) But I have a very pleasant duty to perform and one which, I know, will commend itself to every one of you, and that is to propose a Toast to our worthy Chairman. I have not known him for so long as one of the previous speakers who proposed his health, but I have known him long enough to appreciate the enormous amount of work which he has done for the benefit of this Association and for the profession generally. That work has taken him down to London many times, and so many times that I heard a rumour that, on the last occasion when he was returning to Scotland he was seen to leave the train at every station and go to the booking office. When someone asked him why he did that, he said, "Well, you know, I never know when I am going to be called back!" (Laughter.) Mr. Nairn belongs to that branch of the profession which Mr. Brown has just indicated as the backbone of the profession. We see that on occasions such as this. On other occasions, perhaps, so complimentary a remark is not paid. Soon, I am afraid, they will be defunct, and then the backbone can be placed alongside that marvellous horse Eclipse in the museum of the Royal College in London. (Laughter.) Well, ladies and gentlemen, you do not need a long speech from me, and I know that in this very heated atmosphere the kindest thing I can do is to ask you now to drink to the health of our worthy Chairman, who has won the love and respect of each one of us, and I would like to couple with that the name of our gracious hostess during the week—Mrs. Nairn. (Loud applause.)

The President: I am sure the young members and some of the older members, too, are thirsting to get upstairs and take more violent exercise—(laughter)—but I would assure

you that the pleasure has been on our side this week. My wife has enjoyed it very much; in fact, I tell her she is looking very much better since she came to Edinburgh and had this busy week amongst you all. She has met so many kind people that she has really enjoyed every moment here. I cannot say the same. (Laughter.) I have met plenty of kind people, but I have had moments here that were not just so comfortable. (Renewed laughter.) I must admit that in my professional work I find my pleasure and interest in life. It has been the one interest and the one great pleasure of my life and it has given me all the joy I want, and I have no desire to alter it. Not only have I found pleasure in the work but I have found great pleasure in meeting my fellows in the profession, and it has been a constant joy to me, because the trouble that I have experienced with them has been practically nothing at all. I would just in a word thank you all for the way you have received the Toast. I would thank you on behalf of my wife and myself not only for your kindness to-night but for your kindness throughout the Congress and for months in the past. (Loud applause.)

The company proceeded upstairs and engaged in dancing and social entertainment.

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LADIES' BENEVOLENT GUILD DANCE

The week's enjoyable social events were brought to a most successful conclusion by the Ladies' Veterinary Benevolent Guild Dance, which was held in the Freemasons' Hall on the evening of Thursday, August 2nd. The function was attended by some 250 members and friends, and proved a delightful one.

At the beginning of the evening, bouquets were presented to Mrs. Nairn by Mrs. Ritchie, and to Mrs. McGregor by Mrs. Mitchell, on behalf of the ladies at the Congress.

The animation of the proceedings was intensified by the introduction of two novelty dances, which proved a great success and a source of merriment. The Animal Novelty Dance prizes were awarded to Mr. and Mrs. McQuaker, and that for the Spot Dance to Mrs. Stratford and Mr. Steel.

During an interval, the various prizes were presented by Mrs. Nairn, who was introduced by Major McGregor.

At the request of Captain Robert Simpson, Mrs. Nairn presented the Simpson Cup and Silver Medal for the Golf Competition to Mr. J. C. Grant, and the Silver Spoon to Mr. J. T. Edwards. The Dunkin Ladies' Cup was presented to Mrs. McQuaker.

On behalf of the Ladies of the Congress, Mrs. Mitchell charmingly presented Mrs. Nairn with a very handsome brooch as a memento of the great interest she has always taken in the Ladies' Benevolent Guild. In replying, Mrs. Nairn thanked the ladies for the gift and expressed her pleasure in having had an opportunity of meeting and working with so many kindly and helpful members, not only of the Ladies' Guild but all connected in the smallest degree with the veterinary profession.

In the raffle for the Supper Cloth, organised by the Guild, the first prize of the large cloth went to Mrs. Jackson Young, and the second prize of a small cloth to Mrs. A. W. Baird.

This pleasant evening was the culminating effort of the work of the Ladies' Guild, the members of which have worked very energetically during the past year under the able presidency of Mrs. J. G. McGregor. The Committee of the Guild made every effort successfully to augment the Benevolent Funds of the profession, and it is hoped that from the work during the Congress week a sum of not less than £80 will be added to those funds.

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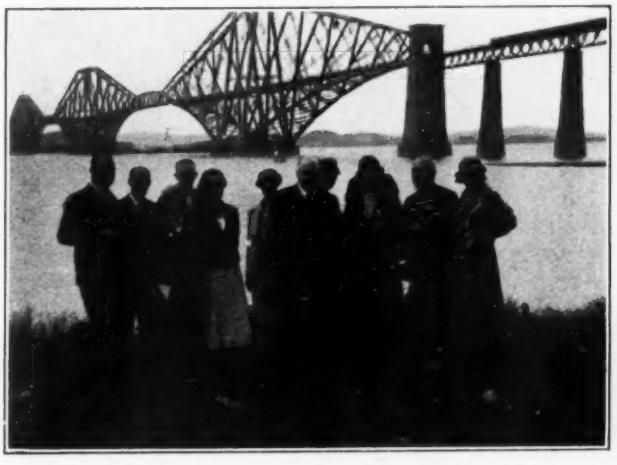
OUR TRIP TO THE TROSSACHS

It required the use of four motor coaches of the Scottish Motor Transport Co., each with a seating capacity of 20, to convey those of us who, "from a sincere regard for their physical well being" decided to take this 130-mile round trip.

Upon leaving the Dick College at 9.55 a.m., the overcast sky and some sprinkling of rain failed to damp the ardour of those bent upon seeing that strip of land in Western Perthshire which in English means "bristled land," and which might even be called the frontispiece of Scotland's poetry.

From the College we passed through the meadows, then the Toll Cross, on to the Corstophine Road. Soon we saw on our left Murrayfield, the ground on which has been fought



Truants of the Trossachs Tour, at Queen's Ferry.

many a memorable international rugby duel—then, in a few minutes and to our right, the Scottish Zoological Park. Further on we soon obtained southward a fine vista of the Pentland Hills, accentuated in their beauty by the clear visibility. The sun was now shining brilliantly as we sped onwards past the famous Turnhouse Golf Course. The road forking left was the main Glasgow route but we were on the way for Stirling. The first crop clover-cut was still in those large cocks unfamiliar to those hailing from south of the Border. At Burnside, the barley, almost ripe, was badly laid in places as the result of exposure to stormy weather. The wheat was fast changing in colour to gold, the oat crop looked almost ripe and some *Senecio jacobea* greeted our gaze on the pasture land.

Linlithgow, pleasaunce of the Stuart kings, was now reached, but time did not permit of our going inside this Castle where Mary Queen of Scots was born. Just before dipping into the village of Polmont our view, looking right of the Ochils, was as clear as one could have wished for. Fine specimens of oak, sycamore, ash and elm presented themselves to us in patches of woodland before we reached Lauriston.

Now on to Falkirk, made famous by its Carron iron-works, and we crossed the Forth of Clyde canal. We are told that carron oil bears its name from the fact that lime water and olive oil emulsion was first used to treat burns at these works. Before we reached Bannockburn, an excellent distant view was obtained of Stirling Castle, while to our right, capping a beautifully-wooded hillock, was the monument erected to William Wallace, the hero of early fourteenth century Scottish history. At Bannockburn we passed the flag in an old bore stone which marks the site of the famous battle of 1314. Reaching Stirling, we turned left on to the Dumbarton Road, to pull up at 11.30 a.m., at the foot of the hill which is crowned by the Castle—this ancient seat of kings and residence of James V. Having only been given 10 minutes' wait, we used the time climbing some half way up the hill, noting *en route* as we passed the fine bronze life-sized monument of Sir H. Campbell-Bannerman, 1836-1908, erected by the South African Government in appreciation of his work.

On re-starting and skirting the hill, we were favoured with a closer view of the Castle as we crossed the upper reaches of the Forth. Passing bean fields, we ran through clusters of Scotch firs and spruces, reaching Thornhill in nine miles. Four-and-a-half miles further on we were greeted by views of heather-covered hills to our right and which afforded those beautiful tints of mauve accentuated in their loveliness by contrast with the green sward sweeping down from the hill tops. We were now soon skirting on our left the Lake of Monteith, with its waters shimmering in the sunlight, and the land to our right was bracken-covered. We were fast arriving at that romantic country, chronicled in Scott's "Rob Roy": Aberfoyle, famed from its associations with Jean McAlpine's Inn, the "Clachan", of Rob Roy, being soon reached. At Bailie Nichol Jarvie Hotel we turned right to climb the new road on the sides of which the silver birches and willows became fewer and fewer, the higher we went. We were now soon scenting the heather, the perfume of which was wafted to us by the gentle breezes over the moorland. At the brow, on reaching almost 2,000 feet, we came into view of some rugged Highland grandeur and our only reminder of the activities of modern civilisation was the notices at intervals admonishing us against the risk of heath fire. On the other side of Loch Achray was the Trossachs Hotel—our destination for lunch, and this we reached at 1 p.m., without as yet having seen any monsters!

Lunch over, our steps were now directed along "where twines the path" to Loch Katrine, upon whose shores we considered:

> "Where shall he find, in foreign land,
> So lone a lake, so sweet a strand?"

Strolling sufficiently far to view Ellen's Isle, we saw also:

> "High on the South, hugh Benvenue,
> Down on the lake in masses threw
> Crags, knolls and mounds confusedly hurl'd,
> The fragments of an earlier world."

Scott, by his mighty pen, has added such glamour to these regions that a reading of his "Lady of the Lake" describes the scenery.

Turning now homewards where "The headmost horseman rode alone" we reached Brig O' Turc, so called as having been the spot where was killed the last turc (wild boar of Scotland). Next we skirted Loch Vennachar on our right, where pearl fishing is still pursued by gypsies, and by Coilatogle Ford, where the famous combat between Fitz-James and Roderick Dhu was staged. We soon reached Callander, the popular touring centre on the banks of the River Teith; thence through Doune, Dunblane and Bridge of Allan to re-enter Stirling at a spot which afforded us a good view of this old bridge.

We now made for Airth and it was not long before we saw the masts of the transmitters of the Scottish Regional and National Wireless Stations and obtained a fine view of the Forth Bridge. This bridge, commenced in 1883, and completed in 1890, has a total length (including the approaches) of 1½ miles; the train traversing it is 160 feet above sea level; its construction required the use of 51,000 tons of steel and 7,000,000 rivets. We were told that an Edinburgh native once accompanied an American in a boat which passed under the Forth Bridge. The observant American, on noticing the

bridge, enquired what such a fretwork structure might be. The Scotsman replied "I dinna ken; it was no there last nicht." We were now approaching the end of our wonderful journey, and as we passed beneath the bridge at South Queensferry, there was pointed out to us the Earl of Rosebery's estate on our left.

At 5 o'clock, we re-entered Edinburgh, after a truly memorable day.

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TOUR TO LINLITHGOW PALACE

Although a comparatively small party took this outing on the Wednesday afternoon, those who did so were well repaid by the enjoyment afforded.

The direct route to Linlithgow was taken, to enable the party to spend as much time as possible at the principal place of interest.

The Palace is situated in a magnificent position overlooking a loch. One of its most interesting features is the room where Mary Queen of Scots was born. The oldest part of the building still remaining consists of pillars at the base of the Palace; these date from about the 12th century.

After viewing the Palace the party had tea and then the tour continued back to Edinburgh *via* Queensferry, where the Forth Bridge was viewed.

* * * * *

A Happy Group on the Boat Going Over to Inchcolm.

TOUR TO THE BORDERS

The party was much smaller than that participating in the Trossachs tour, but what we lacked in numbers we made up in enthusiasm, and I think I can safely say that those who did not avail themselves of the tour missed a treat indeed.

We saw many places of interest—some famous for their scenic beauty; some noted for their historical interest; others celebrated by reason of their connection with great men of the past—and all of them revealing to us phases of Scottish life and types of Scottish scenery that could not fail to interest, and acquaintance with them added greatly to the pleasure of our visit to the land north of the Tweed.

Leaving the Royal (Dick) Veterinary College by coach, we proceeded to Dalkeith, through Pathhead, and after a steep and impressive climb of about one mile we reached the summit of Soutra Hill. This is an extremely wild stretch of country. Poles are placed all along the incline of Soutra Hill so that travellers may recognise the road in winter.

To the right of Soutra Hill is the Isle of the same name, the sale of which has resulted in about 700 poor persons receiving a pension of about £20 per year.

From this hill we continued southwards to the ancient town of Lauder. It is claimed that the Scottish Parliament met here in olden days, and it was from Lauder Bridge that the Earl of Angus and some Scottish nobles planned to hang the Earl of Mar and other favourites of James III against whom they bore a grudge. For his leadership in this exploit the Earl of Angus earned the title of "Bell the Cat."

On leaving Lauder, we proceeded to Earlston—the reputed birthplace of Thomas the Rhymer, the first of the Scottish bards and prophets.

Proceeding by a beautifully wooded road through the Broom of Cowdenknowes, we came to Bemersyde Hill. On the way there we had a glimpse of Bemersyde House—a mansion presented by the nation to the late Earl Haig—so Thomas the Rhymer's prophecy is true:

> "Time, time, whate're betide,
> There'll aye be a Haig in Bemersyde."

From the summit of Bemersyde Hill we saw the famous view which afforded Sir Walter Scott such never-ending pleasure. It is said that here he regularly reined in his horse to gaze upon the beauties of the Tweed and the Eilden Hills.

Our next stop was Dryburgh Abbey Hotel, and after lunch we visited the Abbey—a picturesque monastic ruin which was built about the eleventh century.

It is the burial place of Sir Walter Scott, and in a near-by grave, in ancestral ground,

lie the remains of that great soldier, Field-Marshall Earl Haig.

From the abbey we journeyed to Melrose, passing through the village of St. Boswells, described by the guide as the most beautiful village in Scotland. We discovered later that this was his birthplace—which explains a lot.

Melrose is an attractive town famous for its abbey whose beauty, design and detail of its carving and construction, place it foremost amongst Scotland's ancient monuments.

The Trimontum, or triple peaks, one of the strongholds of the Roman occupation, is situated close by.

On leaving Melrose, we proceeded to Abbotsford House, the residence of Sir Walter Scott. Here we received a real Scottish welcome from pipers clad in native costume.

The house contains many personal memorials of its founder and numerous interesting historical relics. The entrance hall might be described as an architectural museum. The study is said to be little altered from the time when it was the scene of Sir Walter's literary industry, and contains many thousand volumes of works.

In the morning room we saw a most wonderful piece of Chinese art—wall-paper at least 150 years old, hand-painted, representing the different periods in the life of man.

From Abbotsford House we moved to Galashields, where a halt was made for tea, and after admiring the war memorial—a most beautiful piece of work—we journeyed to the Forth Bridge. From here we proceeded to Edinburgh, arriving in nice time for the evening function, having spent one of the most enjoyable days of the Congress, without a weary moment—thanks to our guide, who kept well within the compass of an easy and pleasant day's excursion.

A. McL.

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"THE ROYAL MILE"

Although the numbers of members and ladies remaining in Edinburgh on the concluding day of Congress had thinned considerably, the guide appointed by the Scottish Motor Traction Company for the purpose had a large and enthusiastic party to conduct along that historic and romantic feature of the "old" city—the Royal Mile, which extends from the Castle to the Palace of Holyroodhouse.

Time was almost ludicrously inadequate for the inspection and the most rapid relation of the features of a tithe of the treasures encountered in that all-too-rapid transit of the Lawnmarket, High Street and Canongate, and it was satisfactory to know that most—if not all—of the company had already gloried in the Castle, with Lorimer's unsurpassable Scottish National War Memorial and the architectural splendour of St. Giles Cathedral, and had inspected the treasures of the Palace of Holyroodhouse.

The ascent of the Outlook Tower—to obtain a magnificent view of the city—preceded "calls" at or opposite a score or more of features of interest, including Lady Stair's house, the Old Tolbooth Prison, the home of John Knox and the houses of Huntly and Moray, and a peep into many of the famous and intriguing ancient closes in which Edinburgh abounds.

Operation and Demonstrations

The Provisional Committee for the Edinburgh Congress decided, in their wisdom, that, so far as the practical side of the proceedings was concerned, emphasis should be laid rather upon demonstrations of lesions of disease and the technique of processes of detecting the pathological than upon manifestations of skill in the performance of operations. Members as a whole appeared to approve their choice, which was doubtless dictated by past experience of operative occasions when many have attended but few have seen, and also by the fact that the College premises—the museum in particular—were splendidly adapted for the display and leisurely perusal of the almost countless exhibits utilised by the many demonstrators who so kindly came forward at the call of the committee. The Thursday demonstrations at the College, moreover, received splendid reinforcement from the Moredun Institute staff, who welcomed members to their fine institution on the Monday afternoon.

Universal satisfaction was expressed, however, at the opportunity which was afforded of witnessing Captain E. Brayley Reynolds perform an operation for "roaring" on the Thursday afternoon, at which session the equine subject was brought further into the picture by Major G. E. Oxspring, R.A.V.C., with an informative demonstration of X-ray technique, with particular reference to navicular disease.

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AN OPERATION FOR "ROARING"

The performance of this operation, on Thursday afternoon, by Captain E. Brayley Reynolds, O.B.E., M.R.C.V.S., of Newmarket, attracted a large number of members to the Equine Operating Theatre at the Dick College. Satisfactory arrangements had been made for the accommodation of the onlookers, many of whom secured a good view of the operation, which was performed with the precision and rapidity associated with the work of this surgeon.

At its successful conclusion, Captain Brayley Reynolds materially increased the value of his

practical contribution to the Congress programme by making the following observations on the subject.

NOTES BY E. BRAYLEY REYNOLDS, O.B.E., M.R.C.V.S.

Owing to the short time at our disposal it is not proposed to review in detail the evolution of the ventricle stripping operation for the relief of roaring in horses through the Gunthers, father and son, Williams and Hobday, but, in passing, merely to acknowledge and pay tribute to each for his share of the perseverance and skill that has placed the operation in the position of one of economic importance to horse owners.

The method demonstrated to-day is precisely the same that was demonstrated at the Annual Congress at Bath in 1922, and there has been no reason, as far as one has been able to ascertain, to vary in the least degree the operation itself. The only improvements that have been made are in regard to extraneous details in carrying out the operation and in the immediately subsequent treatment of the animal. Much benefit has been obtained from some of these.

Since so few could have followed the operation just performed, a brief statement of the more particular points and the reason for adopting them may be desirable. Before mentioning these, however, it might not be out of place briefly to trace the steps by which they were arrived at.

Going back to pre-war times it will be conceded that whereas a high proportion—70 to 80 per cent. possibly—of the animals operated upon showed very great improvement following the ventricle stripping operation, there was only a very small proportion of these, about 10 per cent., that made no noise. One was compelled to observe, as soon as one started practising the operation, the great variation in the condition of the larynx in different animals; and it seemed reasonable to suppose that the operation as then performed was not dealing successfully with all these variations, but that by some modification of it the percentage of complete cures might be made higher.

Perhaps the most noticeable feature in a number of cases was the fixation of the left arytenoid cartilage towards the median plane of the glottis, along with a definite ridging of the vocal cord across its anterior part. Outward pressure by the finger could not move them towards the wing of the thyroid. How, then, could one hope to get close outward adhesion of them? It is likely that this particular condition is brought about, in part by anchylosis of the crico-arytenoid articulation, and in part by a definite contraction of the cord from disuse resulting from paralysis of the posterior crico-arytenoid muscle.

In Mesopotamia, at the termination of the war, it was found necessary to destroy and bury some 300 to 400 animals per week. From these several batches of roarers were selected; the members of each batch was operated upon on the same day and one killed every few days. In this way one was able to observe the process of reparation, following several modifications of the operation, from the time of operating up to complete healing of both the internal and external wounds.

For purposes of the following description the long axis of the larynx is assumed to be horizontal.

In regard to the method carried out to-day, the first particular point to mention is in connection with the incising of the dorsal margin of the ventricle. Situated above the mouth of the ventricle is a small triangular area composed of a double thickness of mucous membrane; one layer of it forms part of the lining of the larynx, and the other forms part of the lining of the ventricle itself. This area is bordered in front by the ary-epiglottic fold, or false vocal cord, behind by the anterior border of the arytenoid cartilage and below by the dorsal margin of the ventricular opening. The first incision should be made along the extreme free edge of this double layer of membrane, and to enable this to be done easily and with precision a pair of ventricle dilators should be used. Any encroachment upon the triangular area of that part of the membrane forming part of the lining of the larynx will tend to produce a constricting effect upon the lumen of the glottis.

Enucleation and complete removal of the membrane lining the ventricle is then carried out, taking care that included in this is the lining of the corners just inside the commissures (if one may so describe them) of the mouth of the ventricle, namely, the one near the junction of the vocal cord with the arytenoid cartilage and the other near the junction of the true and false vocal cords. The vocal cord is then grasped with a pair of suitable forceps at about three-eighths-of-an-inch from its attachment to the arytenoid cartilage and a transverse incision completely severing the cord is made about half-way between the forceps and the latter; a second transverse incision is made on the opposite side of the forceps at about an equal distance from them, that is, about half-an-inch from the first. As traction is applied by the forceps during the making of these incisions they appear to be about three-quarters of-an-inch long. A third incision connecting the other two completes the removal of a piece of the vocal cord with the overlying mucous membrane about half-an-inch square exposing the belly of the lower portion of the thyro-arytenoid muscle, which should not be cut. It will be

noticed that whereas a small square of membrane and cord has been removed, the three incisions assume a continuous semi-circular line extending the whole length of the ventral lip of the ventricle from the corner of the arytenoid cartilage to the junction of the vocal cord and the ary-epiglottic fold. This has been brought about by the contraction of the remaining portion of the cord towards its insertion on the body of the thyroid.

This re-section of a portion of the vocal cord frees the arytenoid cartilage for closer adhesion to the wing of the thyroid, and, in addition, removes a ridge which in a number of cases is already pronounced at the time of operating, and which, it is quite conceivable, may develop later in other cases following stripping alone of the ventricle.

It is necessary that reference should here be made to an article written by Professor A. Coquot, and published in the *Recueil de Médecine Vétérinaire*, Vol. xciii, Nos. 1-2, January 15th-February 15th, 1917. After reviewing the various operations that have been practised for the relief of chronic roaring in horses, and the anatomy and physiology of the larynx, he describes an operation practically identical with that which has been demonstrated and described, and although this article did not appear until the beginning of 1917, it should be noted that he had been operating in this way for four years. He says: "It is based upon these considerations that we have practised, since 1913, the following double operation: after having completed stripping the ventricle, the middle part of the vocal cord is grasped by a pair of dissecting forceps, then, by means of a pair of fine straight scissors, we make an incision above and below the forceps, so freeing the middle portion of the cord, which we cut across below, thus taking out a piece from 10 to 12 millimetres square." And later: "We have not had the opportunity to make *post-mortem* examinations of animals operated upon in this way and so verify the conceptions we put forward based exclusively on the principles of the physio-pathology of the larynx."

That the same method of operating should have separately been dictated, on the one hand, theoretically by the physio-pathology of the larynx, and on the other, practically by direct experimentation, should be a strong recommendation for its adoption.

Slight variations in procedure in the operation demonstrated to that recommended by Coquot are that the mucous membrane of the ventricle is enucleated by means of the finger and forceps and the incisions freeing it are made precisely round the opening of the ventricle and that the piece of vocal cord removed is that next adjacent to the arytenoid cartilage; slightly less substance is left in the side of the larynx to heal to the wing of the thyroid. Coquot recommends the use of burr-forceps to evert the membrane, but this and similar methods do not ensure that the incisions freeing it are so correctly placed.

Hunters.—It is upon this class of animal that by far the greatest number of operations are performed, the chief reasons being that there are more of them, and that a larger proportion of them go wrong in their wind.

It is not proposed to give any statistics, for the simple reason that unless these are absolutely complete they are useless, and they never can be completed. But, judging from those cases of which one has heard the result, one can safely assert that the percentages of those that make no noise and those that are only benefited are reversed, or more than reversed, to what they were in pre-war times.

Cart Horses.—These appear to be exceedingly good subjects for the operation, as far as can be indicated by results.

Thoroughbreds.—Too long a rest after the laryngeal operation for the relief of chronic roaring in this species has been advised. This is unfortunate because, without doubt, it is in this class of animal that the best results are obtained; and it is highly probable that one must look for the explanation to the evolutionary development of an anatomical structure. One can readily understand that in the evolution of the racehorse the better development of the respiratory system has played a part equally important as that of any other, and it follows that the larynx would be included in the development of this system. Speaking purely from the naked-eye appearances, it is probable that one would readily assert that the lumen of the larynx of the thoroughbred is proportionately greater than that of other breeds of horses.

The greatest stumbling block, probably, to the more frequent adoption of the operation in this breed is what has been thought to be the great loss of time and condition. Fourteen to 21 days' complete rest is all that is necessary as far as the healing of the wounds, both internal and external, is concerned, and consequently if the animal has been in good condition at the time of operating no great loss of it will occur. This applies to horses of no particular value, but in regard to the best-bred animals that are known to possess good form, say as two-year-olds, this matter of time should be a secondary consideration. The all-round benefits to be derived from the operation do not appear to be sufficiently understood by owners of blood-stock, the chief reason for this being that, quite apart from the professional ethical aspect of the question, one must consider one's obligation to the owner and hesitate to mention

the fact that certain animals have been operated upon. The operation of tracheotomy has been much preferred. It is reasoned that there is no loss of time or condition, and also, and quite rightly in many cases, that since the animal is already a roarer it has no great value and does not justify the expenditure of money and time upon it.

The following results in regard to 39 animals would seem to justify the remark that it is in thoroughbreds that the best results are obtained:—

Thirty-three made no noise.

One makes a slight whistle when first pulling up, but it soon ceases, and the horse has won five races and been placed in five others.

Two made a slight noise at first, but later improved, and one of them has since won races in South Africa.

One at first was said to be no better; no further report has been received, but returns show it as winning races.

Two no reports, one being sent to India.

Of the same 39 animals, two were not raced again, two had accidents and were unable to race, one went to India and no record of its performances is available, and two went as hunters, one winning a point-to-point. The remaining 32 animals have taken part in 222 flat races from six furlongs up to one-and-a-half miles, being placed in 68 of them, including 33 wins, and in 170 hurdle races and steeplechases from one-and-a-half to four-and-a-half miles, being placed in 73 of them, including 25 wins. All were bad roarers.

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Major-General Sir John Moore expressed the thanks of the members to Captain Brayley Reynolds for the performance of so interesting and valuable an operation and for supplying the additional advantage of informative notes on its technique, purpose and results. Captain Brayley Reynolds replied in suitable terms.

FOX PEST IN NORTHERN IRELAND

Foxes have become a pest in many parts of Northern Ireland and farmers and sportsmen are combining in an attempt to lessen their depredations, which have seriously reduced game in the mountainous districts of Tyrone and Antrim. The Wildfowl, Game and Fish Protection Society has obtained the services of a trapper from Scotland, who is engaged in the neighbourhood of Ballycastle. He works with trained terriers, which display remarkable courage in tackling the foxes. In the view of the society, however, the Government will have to tackle the problem and adopt measures on a wider scale than can be done by private interests. Farmers, it is stated, are now more seriously affected than sportsmen.

DEMONSTRATIONS

The Visit to Moredun Institute

In describing this visit to the Moredun Institute, which took place on the afternoon of Monday, July 30th, it was hoped to give the names of the members who availed themselves of Professor J. Russell Greig's kind invitation—but when one, two and three coaches rolled up packed to capacity and innumerable private cars disgorged their eager loads, the attempt at securing names was given up in despair; let us content ourselves with saying, therefore, that the President, accompanied by a very large body of members and ladies, visited the Moredun Institute.

Here we were received by the Director, Professor Greig, and his good lady, whose genial smile made us feel that we were really welcome.

The members quickly divided themselves into groups, but even then so great was the crowd that we had to take it in relays to get into the various rooms.

The body to which I attached myself literally besieged Dr. Gordon in his room and for over half an hour he held us spell-bound with his masterly description of the research work—and very successful research work indeed—carried out on louping-ill and tick-borne fever. Those of us who are acquainted with the methods employed in research work quickly appreciated the immense amount of labour and ingenuity shown in overcoming the various difficulties. Methods of vaccination were dealt with and the results in practice—as evidenced by the statistics which were very lucidly presented—are highly successful. An alternative method of control, *viz.*, dipping to remove the ticks, was mentioned, but compared with the ease and reliability of vaccination this method is not likely to be adopted.

From louping-ill Dr. Gordon passed to lamb dysentery and braxy and we all admired the careful manner in which the results of vaccination in the field were checked up. As Dr. Gordon had mentioned Mr. Brownlee several times, we felt that we should visit him next and found him with an interested audience.

He showed and explained most lucidly the pathological and cytological changes occurring in louping-ill and tick-borne fever. We were all rather struck with the idea of polymorphonuclear cells attacking the cells of Purkinje, but when he explained that it was the virus in these cells which probably exercised the attraction for the "polymorphs" we felt more relieved. His preparations were very beautiful and as a final touch we were privileged to see an ovine Demodex.

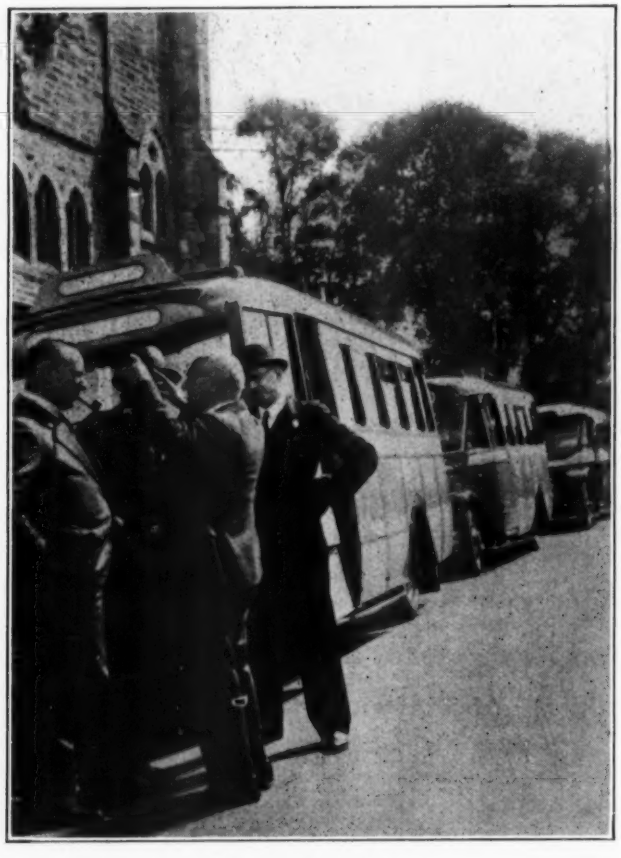
Our next "port of call" was Mr. Wilson's room, and we were indeed amply repaid for our visit here. His museum specimens were beauti-

fully prepared and were very fine specimens, particularly those concerning lamb dysentery.

We were all greatly impressed with the great care and exacting precautions taken in the preparation of the various biological products, particularly braxy vaccine and lamb dysentery vaccine and serum. There is certainly a great measure of responsibility attaching to this work, and practitioners must surely realise the importance of dealing with reliable laboratories under capable veterinary officers.

From Mr. Wilson's laboratory we gravitated to Dr. Dryerre's. Here the crush was so great that we were compelled to halt at the door. Dr. Dryerre has certainly the gift of interesting his audience and I met at least one enthusiastic practitioner who spent all his time with Dr. Dryerre, who discussed and explained many points in connection with milk fever, lactational tetany, iron deficiency, etc., which must have proved illuminating to all practitioners.

We overheard many discoursing with enthusiasm about Dr. MacLeod and his ticks, so having ascertained that he had these "beasties" in the tent, we wended our way thither. We were not long in discovering that Dr. MacLeod is a master of his subject. The interesting manner in which he presented the life history of the ticks to us, the influence of moisture and temperature and how these conditions affected the seasonal appearance of tick-borne diseases, was an education in itself. The numerous questions which we put to him were answered ably and concisely. Perhaps the novelty of his subject made a special appeal to us, but certainly he succeeded in interesting "our" crowd and we all enjoyed the talk with him.



What Is It?
Enquire Dr. McCunn, Captain Leyshon and Mr. Perry.

Our last call was at the Metabolism Room and we were all delighted with the quiet assurance with which Dr. McCallum explained and demonstrated her subject. Feminine efficiency was certainly very much to the fore and our questions presented no difficulties to her. It gave many of us a keener insight into the elaborate precautions taken in working out metabolic rates.

Did I say our last "port of call"? If so, I am forgetting the tea buffet—and a right good tea we had, too. Altogether it was a "great" day, so when President Nairn proposed a vote of thanks to Professor Greig and his staff for the splendid programme they had provided and their kind hospitality, our applause was spontaneous.

They were all so good that I cannot think of any one to single out for special mention, and I return personal thanks for a highly interesting and instructive afternoon.

H. G. L.

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X-Ray Technique with Particular Reference to Navicular Disease

G. E. OXSPRING, R.A.V.C.

In giving this demonstration, before a large and intensely interested company, Major Oxspring made the following observations:

The scope of this demonstration is necessarily a very limited one, and as the subject of X-ray technique has filled many volumes it is intended to confine my remarks to a few elementary principles of radiology generally and as applied to the horse's digits, particularly.

A great deal of work and experimentation has been done at the Royal Army Veterinary School, Aldershot, on equine radiology, and its economic value has now been generally accepted.

This is well illustrated by the fact that during the last two years the number of exposures I have been called upon to make, and report on, has nearly reached the 1,000 mark, apart from experimental work.

Unfortunately, it is essential for the radiologist to have some knowledge of electrophysics, especially in the case of the veterinary radiologist, who is working in an uncharted "field," and has not the advantage of the mass of radiological data concerning his patients that is available to the human radiologist. Alterations in

calibrations of the various factors make all the difference to the value of an interpretation. Furthermore, a lack of knowledge of radiological physics during the manipulation and care of such a delicate instrument, may be costly and even disastrous.

The elementary points of this part of the subject are as follows:—

The first essential for the production of röntgen rays is a supply of electricity, the simplest source being from an electric main, which is usually 200 to 250 volts. The next consideration is the type of this primary current; if D.C. it must be converted into A.C., which is done by means of a converter (various types). The low voltage is quite useless for the purpose of producing X-rays, and must be transformed, by means of step-up transformers, to a very high voltage. This varies according to the make of apparatus, but the one at the Royal Army Veterinary School is capable of producing secondary voltage of 150,000 volts, which at this stage is spoken of in terms of kilovolts, *i.e.*, 150 kilovolts. This high kilovoltage is, however, never used, as the tube in use is designed for a lower one.

In radiology the voltage and milliamperage are factors which determine the quality and quantity of X-ray emanation.

Having obtained the necessary high voltage, it is applied to an X-ray tube, which is the source of the rays. It is the most fragile and, generally speaking, the most expensive part of the apparatus. Roughly, it consists of a glass-walled vacuum tube, containing one metal terminal—the cathode, and another—the anode or target. X-rays are produced by a current consisting of minute electric particles (electrons) projected from the cathode to the anode. The latter consists of tungsten which has a high melting point. The X-rays originate at the point of impact of the electron on the target.

The Coolidge tube now generally used is constructed with a tungsten wire filament at the cathode, which is heated with a separate filament current. This hot filament gives the electron supply. Metalex-protected tubes are now made, which permit the beam to escape in one particular direction, by means of a glass window. This protects the operator from direct rays, but not from secondary rays from the patient and other objects. This tube is suitably earthed.

A great amount of heat is produced at the point of concentration of the electrons on the anode. This is controlled by means of a radiator, air or water cooled.

Röntgen rays have the power of penetrating most substances, some with greater facility than others, and also have the same effect on the emulsion of a photographic plate as ordinary light, on which property the production of X-ray photographs depends—the contrast depending on the variable penetration in different tissue. The power of exciting light on certain crystals, possessed by X-rays, is responsible for the fluorescent and intensifying screens.

Cassettes.—These are simply light-proof containers for the films, for use during exposure. They are made of pure aluminium, which is penetrated by X-rays, but not by ordinary light.

Intensifying screens are fabric coated, with crystals which fluoresce with X-rays. They are made in pairs, and the film is placed between them. Their object is to intensify the rays applied and so shorten exposure times. Photographs which take 10 seconds without intensifying screens might only take 2 seconds when screens are used. Short exposure is obviously to be aimed at, particularly with animals. Intensifying screens are continually being improved, and one acquired by us recently has reduced exposure time by about 50 per cent.

The chief factors which must be considered in radiography are: (1) the actual kilovoltage applied to the cathode—this can be estimated from the voltmeter reading: (2) the actual current—milliamperage as shown on the milliameter; (3) the distance of the anode from the film; (4) the time of exposure, and (5) the density of the material to be radiographed.

These factors can only be obtained by trial and error, and depend on the particular apparatus used.

Films are generally double-coated, and non-inflammable. They are developed like photographic films and according to the instructions of the various manufacturers.

Drying is done by hanging the films on lines, unless urgently required, when they are washed in methylated spirit or formalin.

Interpretation.—The importance of this part of the subject cannot be over-emphasised. It is certainly dependent on good apparatus and technique, because a bad film cannot be interpreted, but apart from this, for the correct interpretation of X-ray films, it is essential to have a knowledge of the normal, as well as the abnormal X-ray appearance. A good deal of practice is necessary because the radiological abnormal is often only represented by the faintest shadow. For interpretation a good clinical training is absolutely necessary. The better the clinician the radiologist is, the better his radiological usefulness.

At the R.A.V. School, experimental work in connection with equine radiology has now been carried on for some years, and the horse's limbs from the elbow and stifle downwards have been successfully radiographed from a practical point of view.

Teeth and cervical vertebræ are not quite up to this standard, but the obstacles, it is hoped, will shortly be overcome.

The bulk of our work is necessarily on the horse's foot, and in this organ the diagnosis of navicular disease has proved of the most practical value. It can now be diagnosed with comparative certainty in all but the very earliest stages. In a large number of cases our experience has shown that it is apparent radiologically before the clinical symptoms have advanced sufficiently to be recognised by the keenest observers.

In Army animals it has proved a great economy, in enabling cases to be disposed of which would otherwise have remained ineffective for considerable periods.

Every case destroyed in the Army, which has been previously X-rayed, is examined at the School, and the findings are carefully recorded and compared with the X-ray reports. The results are such as to give the greatest confidence in X-ray diagnosis. In X-raying horses' feet, we found, after much experimentation, that the best position is with the patient standing on the cassette, which is suitably reinforced for this purpose.

In order to keep the distance factor unvariable, the toe should reach the front edge of the cassette. The tube stand, which must be on wheels, is moved slowly forward to a known position.

The rays are directed through the coronet at an angle which ensures, as nearly as possible, that they penetrate the navicular bone at an angle of 45 degrees, otherwise misleading distortion results.

In all radiography the nearer the object you wish to photograph is to the film the better.

The clefts at the sides and centre of the horse's frog, give rise to air spaces, where the rays meet with little opposition, with the result that, in these places, more radiation gets through, and blackens the negative, leaving dark lines which pass across the navicular bone, and obliterate possible pathological shadows. To overcome this we devised the methods of filling the clefts. If they are filled with material more opaque to rays than surrounding horn, white marks are left; if less opaque to rays than horn, the marks are black.

It was eventually realised that the only material with equal density would be horn itself, and so this was applied in the form of a paste made of powdered horn and lard. If carefully applied it is completely successful. When radiographs are required of the phalanges and other parts of the limb the cassette is supported on a block and held behind the part, and the rays directed at right angles.

The necessity of protecting oneself with lead rubber gloves and aprons, when a lot of X-ray work is done, should not be overlooked.

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Urine Examination

GEO. F. BODDIE, B.Sc., M.R.C.V.S.

Royal (Dick) Veterinary College, Edinburgh

The object of the demonstration was not only to show the technique of the tests commonly employed, but also to show how information thus obtained may be utilised in diagnosis.

Normal and abnormal urines from horses, cattle and dogs were available for those who wished to conduct the tests themselves. The technique of each test was described on a sheet and the necessary reagents were laid out.

Two cases illustrating the value of urine analysis were exhibited: a case of chronic interstitial nephritis in a spaniel; a case of diabetes mellitus in a fox-terrier.

The technique for the following was described:—

(1) Specific gravity and reaction; (2) Albumen; (3) Bile pigment; (4) Bile salts; (5) Blood pigment; (6) Sugar; (7) Acetone; (8) Indican; (9) Deposits; (10) Amount of urea and (11) Glycuronic acid.

It was pointed out that the specific gravity alone formed an insufficient basis on which to found an opinion, but that taken in conjunction with other factors it might be of use in differential diagnosis as between acute and chronic interstitial nephritis.

The reaction of urine is readily susceptible to change in herbivora, turning from alkaline to acid in the case of any disturbance of health accompanied by fever. In the case of dogs the most usual cause of change in reaction is the case of cystitis, in which the reaction becomes alkaline.

Albumen is to be found in the urine as a result of inflammatory changes in the kidney rendering the renal epithelium permeable to albumen. In chronic interstitial nephritis in dogs the amount of albumen decreases as the disease progresses, and in the final stages only traces of albumen are present. A large amount of albumen may be found in the urine of a dog suffering from prostatitis. Acute febrile diseases, especially if associated with tissue destruction, may give rise to traces of albumen in the urine.

Bile pigment and bile salts appear in the urine in cases of obstructive and hæmolytic jaundice.

Traces of bile pigment are frequently found in the urine of dogs suffering from chronic intestinal disease, especially if of a catarrhal nature. The presence of only small traces of bile pigment is not of undue significance.

Hæmoglobin and also actual blood cells are to be found in the urine in cases of acute nephritis, pyelitis, cystitis and urethritis. Hæmoglobin is also present in the urine of any case where there is excessive destruction of red

blood cells; thus, in addition to diseases known to be associated with hæmoglobinuria, it may be met with in cases of pleurisy with effusion. The presence of small amounts of blood pigment in the urine a few days after parturition is not uncommon and seems to arise from vaginal contamination.

Sugar is frequently found in the urine of pregnant and lactating animals. Considerable amounts of sugar in a dog's urine usually indicate diabetes mellitus.

Acetone is found in dogs' urine in advanced cases of diabetes and in marked cases of acidosis. In cattle, apart from post-parturient dyspepsia, it is frequently found in house-fed animals, especially in spring. The exact significance of its presence in apparently normal animals is as yet uncertain.

Indican is normally present in the urine of herbivora in considerable amounts; certain diets appear to give rise to an increase in the amount, and it is difficult to assess the significance of any apparent increase in the amount of indican in alimentary disease in herbivora. In dogs in normal health only traces of indican are found in the urine, and the presence of a substantial amount usually indicates a degree of alimentary stasis along with abnormal bacterial activity and absorption of toxins.

Deposits may be found to contain:—

(1) Epithelial cells, which will indicate the part of the urinary system involved in an inflammatory process, and in the case of cells from the kidney, the part of the kidney itself.

(2) Hyaline casts, found particularly in cases of chronic interstitial nephritis in dogs.

(3) Blood cells, found in any acute inflammatory condition of the urinary tract, *e.g.*, acute nephritis, cystitis, urethritis, etc.

(4) Pus in any suppurative condition of the tract.

(5) Micro-organisms.

(6) Mucus—a considerable amount of mucus is frequently to be found in the urinary deposits of females.

It is important to realise that urine obtained by indirect methods may contain considerable amounts of foreign material, such as grit or vegetable material.

Estimation of the amount of urea may give some useful information. Though the amount of urea is subject to diurnal variation, in the dog on an average diet the figure is usually more than 1 per cent. In cases of chronic interstitial nephritis the amount decreases as the kidneys lose their power to concentrate urea. The amount of urea and the specific gravity may in certain cases give useful prognostic information in such a case. For definite information it would be necessary to estimate the blood urea at the same time as the urea in the urine is estimated.

Glycuronic acid is always present in the urine of herbivora in considerable amounts. As the liver is credited with the formation of glycuronic acid, it is presumed that its absence from herbivorous urine would indicate liver disease; but even in cases with extensive macroscopic change in the liver on *post-mortem*, glycuronic acid was still present in the urine. In the dog's urine there usually are traces of glycuronic acid; if a dose of aspirin were given twelve hours or more before the sample was collected there should be a considerable amount of glycuronic acid in it.

The inability to form glycuronic acid indicates advanced liver disease, but its presence in urine does not negative a diagnosis of liver disease.

Outline of Tests

(1)	Specific gravity ...	Hydrometer.
	Reaction	Litmus paper.
(2)	Albumen	Heat *plus* acetic acid.
		Concentrated nitric acid.
(3)	Bile pigment ...	Nitric acid.
		Iodine Test.
(4)	Bile salts	Sulphur.
(5)	Blood pigment ...	Guaiacum Test.
(6)	Sugar	Fehling's Test.
		Nylander's Test.
		Fermentation Test.
(7)	Acetone	Rothera's Test.
		Gerhardt's Test.
(8)	Indican	Chloroform Test.
(9)	Deposits	Microscopically.
(10)	Urea estimation ...	Doremus Ureometer.
(11)	Glycuronic acid ...	Tollen's Reaction.

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Pregnancy Diagnosis

Mr. W. C. Miller, M.R.C.V.S., F.R.S.E., Edinburgh, was responsible for a most valuable demonstration on this very interesting subject. Unfortunately, the demonstrator's notes have not been received in time to allow of their inclusion in this issue, but we learn from Mr. Miller that he will be forwarding in due course, for publication, a paper "which will be far more than a description of the test, in that it will include the results of some 1,600 or 1,700 cases."

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Bacillary White Diarrhœa

J. E. WILSON, B.Sc., M.R.C.V.S.

Royal (Dick) Veterinary College, Edinburgh

The object of this demonstration was to point out the salient features of bacillary white diarrhœa, which is well recognised as being the greatest source of loss amongst young chicks.

The causative organism is *Salmonella pullorum*, and chicks are most commonly affected during the first few days of life, although losses may continue for several weeks. There are no

diagnostic symptoms, but the history is suggestive and steps should be taken to obtain an accurate diagnosis by forwarding several chicks to a laboratory for bacteriological examination.

Mortality varies, but may reach almost 100 per cent. in some cases. In milder outbreaks many birds may survive an attack and become "carriers," later in life laying eggs which contain *Salmonella pullorum*. The percentage of such affected eggs laid by the individual hen varies from about 4 to 18 per cent. If such eggs are placed in an incubator and hatched, the resultant chicks are affected to a greater or less extent with bacillary white diarrhœa.

The principal function of this demonstration was to draw attention to the method of eliminating the carrier fowl, which may be such a source of loss to the poultry farmer. To this end the agglutination test is used. Phials are sent by request and a small quantity of blood collected by puncturing the wing vein as it crosses the "elbow joint." A suitable needle and instructions are sent out with each box of phials. The samples collected are subjected to the agglutination test and all reacting birds removed from the breeding pen.

It is desirable that such birds be destroyed, as, if retained on the farm even for purposes other than breeding, they may be a source of danger to the birds free from the disease, as the causative organism is sometimes found in the intestinal canal.

This test has proved of great value in ridding many flocks of this troublesome disease and is now very largely practised wherever fowls are kept.

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Tuberculosis in Fowls

W. J. IRONSIDE, M.R.C.V.S., M.P.S.

Loughborough

The material used in this demonstration comprised a number of living birds, several opened carcases, and a series of preserved specimens. The specimens were lent by the Pathological Department of the Royal (Dick) Veterinary College and the birds were secured by Mr. J. E. Wilson of that Department.

The living birds were divided into two lots, one of which demonstrated the appearance of a pen of tuberculous fowls, while the other was used to show reactions to tuberculin. The majority of the opened carcases were those of birds which during life had shown the outstanding clinical symptom of tuberculosis, *i.e.*, emaciation, but in several there were no *post-mortem* lesions of the disease. Advantage of this was taken in laying emphasis upon the necessity of making several *post-mortem* examinations in order to establish the absence of tuberculosis.

The preserved specimens showed the variation in appearance that may be seen at *post-mortem* examination.

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Fowl Pox

W. R. KERR, M.R.C.V.S., D.V.S.M.

Veterinary Research Division, Ministry of Agriculture, Northern Ireland

The principle adopted in staging this demonstration was to present the two aspects of this disease which are of importance to the practitioner, namely, the method of reaching a diagnosis, and its prevention by means of vaccination.

The specimens illustrated the three characteristic forms of fowl pox—mouth lesions, skin lesions and the oculo-nasal form.

The preparation of the vaccine (pigeon pox, Doyle) was also demonstrated, and the method of vaccination carried out.

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Coccidiosis of Poultry

N. DOBSON, B.Sc., M.R.C.V.S.

Research Officer, Veterinary Laboratory, Ministry of Agriculture and Fisheries

Stained microscopic preparations were displayed illustrating the various stages of the life cycle of the coccidium. These were accompanied by microphotographs showing oöcysts as seen in a smear preparation of the duodenal or cæcal contents, early and mature forms of oöcysts, schizonts and merozoites.

Microphotographic diagrams were on view of duodenal and cæcal infestations, showing the course of the infestation day by day, demonstrating the period after the parasite has been ingested when the multiplication is occurring at an enormously rapid rate, with consequent destruction of the intestinal mucous membrane.

Museum specimens were on view illustrating the various forms of the lesions in the duodenum and the cæcum.

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Pathological Material of Topical Interest

J. R. M. INNES, PH.D., M.R.C.V.S.

Institute of Animal Pathology, Cambridge

(*a*) *Tumours.*

Specimens of various tumours and sections of the growths to demonstrate the histology. The following were included: seminoma or embryonal carcinoma, testicle, dog; a number of mammary tumours from the dog illustrating the transitions from benign fibrous to cartilaginous and bone growths, and one case of an extremely malignant metastasising bone tumour; a multiple and malignant primary intrahepatic bile-duct carcinoma of the liver; chronic lymphoid leukæmia (spleen, lymphatic gland and liver). "blood tumours," hæmangioendotheliomata of the fowl.

(*b*) *Nephritis.*

A brief summary of the recent advances in the study of this disease; a synopsis of the classification which has been tentatively adopted in the study of Bright's disease in the dog; a number of specimens of the kidneys from dogs, arranged into classified groups, along with sections demonstrating the lesions. It was shown that the late chronic contracted kidney could be traced back to a previous attack of acute glomerulo-nephritis, and that vascular lesions play a relatively minor part in the genesis of the chronic type of the disease in this animal.

(*c*) *Vitamin C Work* (Experimental Scurvy).

By a series of plates and diagrams the advances which have been made in connection with this vitamin in relation to its importance in nutrition were shown. Sections with appropriate drawings and photos were given to demonstrate the effect of a complete and partial lack of this vitamin in the food on the bones and teeth.

(*d*) *Vitamin D Work.*

Similarly here, attempts were made to illustrate how, step by step during the last 15 years, advances have been made and how these have led to the modern conception of the relation of vitamin D and the parathyroid to calcium metabolism, and how a clearer conception of the pathogenesis of rickets and allied osseous dystrophies has been obtained. Sections, specimens and microphotographs were shown to demonstrate the lesions in the bones and teeth in rickets (hypovitaminosis D), experimental and spontaneous; and as a comparison the effect of massive doses of vitamin D on various tissues (arteries, kidneys, etc.), bones and teeth (hypervitaminosis D). It was explained how, by a comparison of the pathology and biochemistry of these two conditions, a fairly clear idea regarding the mode of action of vitamin D in the animal organism was obtained.

(*e*) *Pathogenesis of Phthisis.*

A complete account of the modern conception of the pathogenesis of this disease in the human being, as enunciated by morbid anatomists in Germany (Aschoff School), was shown in diagrammatic form.

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Miscellaneous Pathological Exhibits

The museum, which had been specially prepared for the Congress, was laid out in two rooms—the Dissecting Room and the Histology Laboratory, both situated in the Anatomy Department.

The various exhibits had all been suitably labelled, but in order to give members of Congress an opportunity of asking questions, exhibitors were, as far as possible, present on the Thursday from 11.30 a.m. to 1 p.m.

Professor Dr. W. M. Mitchell, of the Royal (Dick) Veterinary College, gave a demonstration of bones and joints to illustrate the generalised nature of osteo-arthritis of the horse.

In all, there were representative parts taken from 37 horses.

Numbers 1 to 22 illustrated the varying osteo-arthritic changes as they affect the vertebral column. No particular clinical condition served as a starting point for investigation in these cases.

Numbers 23 to 31, *i.e.,* nine horses, were primarily examined *post-mortem* because they showed clinical signs of shivering.

Numbers 32 to 37, *i.e.,* six horses, were primarily examined *post-mortem* because they showed clinical signs of partial paraplegia (jinked back).

The Ministry of Agriculture and Fisheries' Laboratory, Weybridge, Surrey (*per* Mr. Esmond Brown, m.r.c.v.s., Edinburgh), exhibited a series of pathological specimens illustrating: swine erysipelas, swine fever, and foot-and-mouth disease; also a series of transparent slides illustrating rabies.

Professor J. W. Emslie, b.sc., m.r.c.v.s., Department of Pathology, The Veterinary College, Glasgow, showed various pathological specimens, of particular interest, from domesticated animals.

Mr. E. J. H. Sewell, m.r.c.v.s., of the Veterinary Department, City of Edinburgh, arranged an instructive exhibit of specimens, supplied by Mr. Arthur Gofton, f.r.c.v.s., Chief Veterinary Officer, Edinburgh, two of the three cases in which this was displayed being devoted wholly to a comparative study of tuberculosis. There were very fine specimens of tuberculosis of the udder, illustrating its appearance in early and in late stages. Another interesting series illustrated congenital tuberculosis in the calf, while the lungs of a sheep affected with advanced tuberculosis was a specimen that attracted much attention.

A third case of exhibits contained specimens of various pathological and parasitological conditions. On the balcony hung water-colours illustrating melanosis in cattle, and there were also to be seen many specimens illustrating the condition as affecting various tissues and organs.

Professor H. Dryerre, Animal Diseases Research Association, was responsible for a valuable series of studies of the disease known as "pine," while Dr. W. S. Gordon, Mr. A. Brownlee and Mr. D. R. Wilson, Animal Diseases Research Association, showed studies of louping-ill and tick-borne fever.

Mr. James Spreull, m.r.c.v.s., Anatomy Department, Royal (Dick) Veterinary College, exhibited reconstruction models of the structure of the spleen of the horse, ox, pig, sheep, dog and cat, and Mr. J. Taylor, m.r.c.v.s., Anatomy

Department, Royal (Dick) Veterinary College, reconstruction models of developing teeth in the pig embryo.

Professor G. F. Boddie, B.Sc., M.R.C.V.S., Royal (Dick) Veterinary College, had a most informative collection of the more common poisonous plants found in this country, while a note under the name of Principal O. Charnock Bradley, Anatomy Department, Royal (Dick) Veterinary College, indicated that "All glass cases not specially labelled contain specimens which are permanently housed in this department and cover a wide range of anatomical subjects."

The Ladies Must "Do" Princes Street, and Captain Motton Takes Major Kirk in Support.

MEAT AND SUPREMACY

Dr. J. Neil Leitch, of the London School of Dietetics, addressing the New Health Society at its summer school, said that there was undoubtedly in meat and other animal proteins something which we could not get from any other food; and the history of various savage tribes and even of civilised nations showed that the meat eaters usually prevailed over those who did not eat meat.

Britain owed its supremacy in India to the fact that meat was our staple diet and rice that of India. What would happen if India suddenly adopted a meat diet?

Dr. Leitch added that the soya bean might become the food of the future. It contained a high percentage of protein, and was almost a perfect food in itself.

EXHIBITION OF DRUGS, INSTRUMENTS AND APPLIANCES

Opening by the President

"A DISPLAY REPRESENTATIVE OF ART AND SCIENCE"

The provision of two capacious rooms, adjacent to the Local Secretaries' Office, for this Exhibition gave the representatives of the firms participating therein every satisfaction both on the ground of accommodation for the most effective display of their wares and on that of accessibility for the members attending the Conference. Both took the fullest advantage of the opportunities thus offered, and the splendid stands furnished by the exhibitors rendered the rooms concerned a great centre of attraction.

Following the Official Opening of the Congress at the Dick College on the morning of Monday, July 30th, the President, Members and Ladies present made their way to the Exhibition, and a large assembly participated in the ceremony of the opening of the Exhibition by the President, who was accompanied by Mrs. Nairn.

The President (Mr. W. Nairn), having made an official tour of inspection of the exhibits, addressed the gathering in the following terms: This is the second item this morning and it is quite a necessary and pleasant one, too. Our qualifications are usually described as a "knowledge of the science and art of veterinary surgery and medicine", and if you look around at the display in this room and in the other room you will find that both art and science are represented. In the old days our remedies were somewhat crude and might at least be described under the heading of art—there was certainly more art than science represented in their composition—but to-day we find that there are modern remedies following closely on the findings of research, and for that we are greatly indebted to the many firms whom we have represented in these two rooms, who have adapted the findings of science to the practical requirements of General Practice. The cruder preparations have given way in many cases to products resulting from our extended knowledge of bacteriology, and we see how great a part is played in that respect by this large display of vaccines and sera. Later on, when we seemed to get tired of dwelling unduly on the bacteriological aspect of disease, we had to find another section, and we took up the biochemical aspect, and again we find our good friends providing us with remedies in that section. Notably, if you examine the stands, you will see that calcium is very much to the front. We certainly owe a great debt to the progressive firms who have done all these things for us. Some of my listeners might say we owe more than that to these firms, in these hard times (laughter), but you can best express

your gratitude, I am sure, to-day, by making a close examination of all the products and giving these firms encouragement to continue their good work of making provision for the newer and more helpful remedies. I will not detain you unduly, as there is a Paper awaiting upstairs, but I would formally declare this Exhibition open. (Applause.)

On behalf of the firms represented at the Exhibition, a beautiful carnation bouquet was presented to Mrs. William Nairn by Master Michael Steele Bodger, son of Mr. H. W. Steele Bodger, M.R.C.V.S., of Sutton Coldfield and Tamworth.

The President: I think, ladies and gentlemen, my wife ought on this occasion to reply. (Applause.) She is very fond of flowers and I am sure she will appreciate very highly this beautiful present—it is such a delightful and charming one—but in case she may not feel inclined to start her duties in that section this morning, I would just thank you in a word for the gift. (Applause.) It is now possible to examine the products and make your purchases.

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The Stands

Armour & Co., Ltd., of Armour House, St. Martin's-le-Grand, London, E.C.1, on their Stand, exhibited their full range of glandular products marketed under their trade mark "Glanoid."

These included ovarian solution, corpus luteum solution, pituitary posterior lobe extract, anterior pituitary solution, thyroid tablets, concentrated fluid extract of liver, glycerine extract of red bone marrow, etc.

In addition, they gave prominence to the "Glanoid" sterilised surgical catgut ligatures, which they now prepare in their London Laboratories by a special "heat" process.

Full details and literature were available at the Stand, but any information will be sent gladly to any veterinarians who communicate direct.

Bayer Products, Ltd., Africa House, Kingsway, W.C.2, exhibited several of their well-established lines such as "Odylen" for skin affections, "Aricyl", an injectable arsenical tonic, "Susserin" (swine erysipelas serum), swine fever serum "Behring", and "Omnadin" for distemper.

Regular users of "Odylen" were particularly interested in a specimen package of the new pleasant-smelling quality which is to be issued next month.

In addition to the old friends, "Bayer" displayed a number of useful new remedies. These included entozon granulate—an acridine compound which extensive trials both at home and abroad, particularly in New Zealand, have shown to be a reliable remedy for the treatment of streptococcic mastitis.

Other recent introductions exhibited were "Prolan" for sterility due to deficiency of the sexual hormone, "Nemural" for tapeworms in small animals and "Evipan" sodium for the attainment of short anæsthesia by the intravenous route.

Messrs. Bayer also exhibited their preparations for the treatment of blackhead in turkeys, *viz.*, "Spirocid" tablets, neosalvarsan and myosalvarsan. We understand that these remedies, in common with all the other "Bayer" veterinary products, are supplied for professional use only.

The stand was made additionally attractive by the display of a few well-reproduced posters.

Burroughs Wellcome & Co., Snow Hill Buildings, London, E.C.1, had as the principal feature of their exhibit a display stand which took the form of an hexagonal pyramid surmounted by a hexagonal turret, the faces being devoted to diagrams, illustrations and products relating to lamb dysentery, braxy, blackleg, canine jaundice, swine erysipelas and bacillary white diarrhœa respectively. The faces of the turret carried illuminated coloured photo-micrographs of the causative organisms of the disease to which the corresponding face of the pyramid related.

Details of the exhibits on this display fitment were as follows:—

Lamb Dysentery.

Photo-micrograph—bacillus of lamb dysentery.

Charts showing (*a*) Results from vaccination of ewes with "Wellcome" lamb dysentery prophylactic (vaccine).
(*b*) Results from inoculation of lambs with "Wellcome" dysentery serum.
(*c*) Immunity tests.
(*d*) Intradermic method of testing.

Specimens of lamb dysentery ulcers.

Specimens of lamb dysentery prophylactic (vaccine) and "Wellcome" lamb dysentery serum.

Braxy.

Photo-micrograph—*Vibrion septique.*

Charts showing (*a*) Results of immunisation with "Wellcome" braxy prophylactic.
(*b*) Method of testing "Wellcome" braxy prophylactic.

Specimens of "Wellcome" braxy prophylactic.

Blackleg.

Photo-micrograph of *B. chauvœi*

Charts showing (*a*) Incidence of *B. chauvœi*.
(*b*) Immunity tests.

Specimen of "Wellcome" *B. chauvœi* filtrate.

Canine Jaundice.

Photo-micrograph—*Leptospira icterohæmorrhagicæ.*

Charts showing (*a*) Effect of active immunisation with "Wellcome" leptospira vaccine.
(*b*) Titration of anti-leptospira vaccine.
(*c*) Test of vaccine for immunisation value.

Pathological specimens.

Specimens of "Wellcome" leptospira vaccine (canine) and "Wellcome" anti-leptospira serum (canine).

Swine Erysipelas.

Photo-micrograph—*Bacillus suis erysipelatis.*

Charts showing (*a*) Titration of anti-swine erysipelas serum (mouse method).
(*b*) Titration of anti-swine erysipelas serum (pigeon method).

Pathological specimens.

Specimens of "Wellcome" swine erysipelas serum and "Wellcome" swine erysipelas vaccine (living).

Bacillary White Diarrhœa.

Photo-micrograph—*Bacillus pullorum.*

Four photographs showing collection of blood samples for agglutination tests.

Charts showing death rate in natural outbreak.

Three blood collecting tubes.

Fowl Pox.—Among the recent additions to the list of "Wellcome" serological products is a fowl pox (pigeon pox) virus with which it has been shown that birds may be rendered immune for several months when treated in accordance with the technique described in a circular issued by the firm.

Blackhead Infection.—It has recently been shown that the arsphenamine products "Neokharsivan" Brand neoarsphenamine and "Kharsulphan" Brand sulpharsphenamine are of the utmost utility in combating blackhead infection which has been so serious a menace to turkey breeders. The products may be used either as prophylactic or curative measures and it has been shown that there is no subsequent danger as a result of injecting turkeys with these organic arsenic compounds, the detectable arsenic being quickly eliminated.

"Tannafax," a water-soluble jelly containing tannic acid in a carbolised base, simplifies the technique of the tannic acid treatment of burns and scalds. It has already found favour with the medical profession and should prove of equal value of veterinarians.

Among the compact and easily portable cases issued by the firm should be mentioned their No. 93 "Tabloid" ophthalmic case which, although measuring but 2⅜ in. by 2 in. by ⅜ in., accommodates 160 doses of medicaments which may conveniently be applied to the eye on a vulcanite rod supplied in the case which may be electrified by friction.

The other displays included specimens of "Wellcome" Brand lanoline, "Lubafax," a surgical lubricant for hands and instruments, "Enule" veterinary bougies, "Borofax," an improved boric acid ointment, "Tabloid" veterinary hypodermic products which may be dissolved most conveniently in the syringe, "Soloid" products for the extempore preparation of douches, lotions, etc., "Soloid" microscopic stains, "Agla" all-glass hypodermic syringes, each syringe in itself a masterpiece of craftsmanship in glass. Supplementary displays relating to bovine tuberculosis, with cultures of the bacillus and explanatory charts, photographs and diagnostic agents; abortion; tetanus; and canine distemper, were interesting features of a carefully planned and informative exhibit.

The researches of Laidlaw and Dunkin showed that distemper is caused by a virus. Gratifying results are obtained by means of "Wellcome" Brand distemper prophylactic vaccine, and "Wellcome" Brand distemper prophylactic virus (dried), which are available for use by veterinary surgeons only.

It is of the utmost importance that accurate records should be made in every case of distemper so that method of treatment may be defined. Scientific workers are largely dependent on such reports for the accumulation of the clinical experience essential to the preparation of products for the elimination of canine distemper. The Director of the Wellcome Physiological Research Laboratories urges on all veterinary practitioners the importance of sending to him at Langley Court, Beckenham, Kent, reports of dogs under treatment.

In cases of infective jaundice in dogs, "Wellcome" anti-leptospira serum, experimentally, has given complete protection against subsequent heavy doses of leptospira. In the field, it is found that the serum gives a satisfactory grade of protection for about three weeks. "Wellcome" leptospira vaccine (canine) is used chiefly as a prophylactic in kennels in which periodic outbreaks of jaundice occur.

For the prevention of dysentery in lambs, "Wellcome" lamb dysentery prophylactic (vaccine), has proved of considerable value. In carefully controlled field experiments, ewes injected once during autumn before tupping time (*e.g.*, October), and again once during pregnancy as

near to lambing time as possible, have produced lambs among which the death-rate from lamb dysentery has been reduced to a low figure, whereas the lambs born from non-inoculated ewes on the same farms and kept under the same conditions, have died at the usual rate. The use of "Wellcome" improved braxy prophylactic (as experiments on infected farms have demonstrated) has materially reduced the incidence of this complaint. Approximately 7,000 hoggs have been under observation; the mortality has been eight per cent. in the unprotected and one per cent. in the inoculated on the same farms.

For the treatment of erysipelas in pigs, "Wellcome" swine erysipelas serum, which is made by immunising horses with several strains of *B. erysipelatus suis,* has proved to be of high value when tested by the Frankfurt mouse method and the Laurens pigeon method, as practised in Holland. The first injection of this vaccine is used in conjunction with the serum, *i.e.,* in the serum-simultaneous method, full details of which are given in the booklet issued by the manufacturers.

All serological products displayed at the Burroughs Wellcome & Co. stand are prepared at the Wellcome Physiological Research Laboratories, Beckenham, Kent.

The Canine Insurance Association, Ltd., of 57, Gracechurch Street, London, E.C.3, had an attractive stand facing the corridor leading to the Exhibition rooms. The Association, of which Major-General Sir John Moore is chairman, has seriously tackled the rather complex subject of dog insurance, and it is quite obvious from their latest prospectus—namely, Brochure C—that they have made great progress during the last twelve months. Consequently, it is not surprising that many of the delegates were to be seen at the stand obtaining full details.

The annual dog licence records demonstrate that the number of dogs is again steadily increasing, and, what is more important still is the fact that dog lovers are showing themselves to be much more discriminating nowadays. This means, of course, that the tendency is for the average dog to be a better specimen, and, in consequence, the insurable factor is increasingly present.

The Canine Insurance Association, Ltd., has built up a form of insurance that is both unique and sound, and apart altogether from the intrinsic value of the animal, in the event of death their comprehensive cover includes such eventualities as:—

(1) Death by fire, lightning and accident (including transit risks).

(2) Death from disease or sickness (excluding poisoning).

(3) Death from distemper.

(4) Death from whelping.

(The insurance under these headings is valid following destruction by a veterinary surgeon for humane reasons.)

(5) Veterinary surgeon's fees in respect of any accident.

(6) Recovery of lost or stolen dogs.

(7) Loss of forfeited entry fees.

(8) Liability for personal injuries and property damage and legal costs, including damage caused to sheep, cows or other animals, poultry, etc., claims and legal costs up to £1,000.

With many veterinary surgeons, particularly those resident in large cities and towns, the dog is nowadays an important factor, and they can clearly do their clients good service by recommending the protection of dog insurance in general, and "canine policies" in particular, especially as it is impossible to obtain elsewhere all the benefits that these provide.

In inviting veterinary surgeons to become agents, the Association does not, of course, expect them to act as canvassers, but many are the opportunities they have of bringing a very necessary precaution to the notice of dog owners.

Genatosan Limited, Loughborough, displayed the complete range of bacteriological products produced in the Pasteur Institute (Paris), the Toulouse Institute of Serum Therapy, and the Laigle Bacteriological Laboratory. The well-known general preparations of this firm, *viz.,* "Sanatogen," "Genasprin," "Cystopurin," "Wulfing" brand formamint, and "Genozo" brand tooth paste were also demonstrated and attracted considerable notice.

The principal products exhibited were:—

Nator B.—Composed of sterilised bacteria and is detoxicated; in consequence, it is used either before or during gestation, without risk of infection.

Tuberculin.—Prepared in the Pasteur Institute, Paris. Three types are issued—subcutaneous, intradermal, and avian. The new intradermal tuberculin is suitable for both the ophthalmic and intradermal tests.

Anthrax Vaccine and Serum.—The original Pasteur products, which are universally used with success.

Mulsor and Diamil.—For preventive vaccination and curative treatment of bovine mastitis. *Mulsor* is extensively used with general satisfaction.

Tregor.—For preventive and curative treatment of joint-ill, etc., in foals and calves.

Erysipelas Vaccines and Sera.—The products of the Pasteur and Toulouse Institutes.

Tetanus Sera.—Anti-tetanic sera for prophylaxis (1,500 U.S.A. units) and curative treatment (5,000 U.S.A. units); also the special anatoxin prepared according to the method of Ramon and Descombey. This anatoxin confers an active immunity which lasts at least two years. It is claimed as the method *par excellence* for systematic protection against tetanus in districts where the disease is endemic.

Blackleg Vaccines and Sera.—Prepared in the Toulouse Institute according to the method of Leclainche and Vallée. For all ordinary purposes *Total Aggressin* is strongly recommended; this product was the subject of good report at the last International Veterinary Congress, and it has since proved remarkably successful in English practice. In cases where the cattle occupy extensive tracts of country, or communication is difficult, *Living Spore Vaccine* (*Liquid Form*) is indicated.

Cytor.—A polyvalent vaccine for prophylaxis and treatment in surgical and cutaneous infections; especially useful in cases of interdigital cysts in dogs.

Alvor.—Although primarily intended for the treatment of broncho-pneumonia in lambs and calves, this product has also proved valuable for cases of pulpy kidney in lambs (see *Veterinary Record*, March 26th, 1932).

Sanatogen.—Described as the "True Tonic Food," this preparation is a chemical combination of specially prepared casein and sodium glycero-phosphate. It exhibits albumin and phosphorus in forms which are readily assimilated by the animal organism.

Genasprin.—Pure acetyl-salicylic acid, in five grain tablets. Owing to a special process of tableting, this preparation contains no trace of free acetic or salicylic acids or the other toxic impurities which frequently occur under ordinary methods of manufacture. On account of its purity "Genasprin" can be prescribed much more freely than other preparations of acetyl-salicylic acid, without any risk of unpleasant sequelæ. It is particularly indicated in those hypersensitive cases which are frequently encountered in canine practice.

Cystopurin.—A double salt of hexamethylene-tetramine and sodium acetate. "Cystopurin" acts as an efficient and non-irritating urinary antiseptic and diuretic. It exercises a marked sedative effect on the urinary tract, which quickly results in normal micturition with a rapid lessening of the bacteriuria.

"Cystopurin" is indicated in all cases where the action of hexamine is required, without its disadvantages. It is used successfully in all diseases of the genito-urinary tract.

Veterinarian visitors to the Exhibition were notified that the Genatosan general preparations ("Sanatogen," etc.), are supplied direct to veterinary surgeons—for personal or surgery use—at special professional rates, which prove advantageous.

C. J. Hewlett & Sons, Ltd. Charlotte Street, London, E.C.2, staged a most comprehensive exhibit, which daily attracted the attention of the Members.

Particular interest was aroused by the demonstration of several new instruments invented by Mr. Robert Mitchell, M.R.C.V.S., of Glasgow. The most outstanding of these was a tooth extractor, made on quite a new principle. It consists of a single shaft acting on two tapered teeth and sockets by means of a screw. This instrument gives a positive grip and is light, strong and efficient. A mouth gag suitable for dogs was also shown, this again being on a new principle. It is very light, positive in its action and easily handled.

The mouth gag for horses, which was on view, has been used by Mr. Robert Mitchell for some considerable time and is mentioned in the latest edition of Dollar's "Veterinary Surgery" by J. J. O'Connor. It is admitted to be the safest and most effective mouth gag yet produced, giving a clear view of the mouth without interfering with the free action of the instruments being used. The screws placed at the proximal ends of the arms, instead of the usual ratchet, give security and means of opening the mouth against any resistance. The new pyro-puncture iron, which was displayed, is one in which the needle passes through the bulb of heated metal and can be withdrawn within it or extended at will by simply pressing on the handle. It also has been used by Mr. Robert Mitchell for a number of years.

Among other instruments suggested by members of the profession, were Wilkinson's canine tooth scaler, an ingenious little instrument described and illustrated in *The Veterinary Record*, January 6th, 1934; Elphick's surgical tray, with nickel-plated cover to exclude dust; Ryan's obstetric wire ropes, Trevor Williams' mouth gag and stomach pump, and a new "Penlite" tongue depressor for dogs, with electric lamp combined. The veterinary practitioners' bag, of unique design, has been universally approved, as it will stand firmly and, when opened, the contents either in the lid or interior are immediately available. Hewlett's tannic acid outfit for burns has been as widely accepted by the veterinary practitioner as by the medical profession. Veterinary medicine chests, motor car emergency cases, pocket dressing cases, hypodermic pellet cases, hypodermic syringes, both intradermal and subcutaneous, made a most interesting part of the exhibit.

Among the ophthalmic ointments, in long-nozzled collapsible tubes, we noticed a new preparation—ung. potass. iodid. *et* sodii bicarb.—which is recommended for removing opacity from the eye, and has proved very successful. Prominence was also given to mist. hexaminæ co., a new remedy for colds and chills, which, besides being supplied in bulk is put up in 10 oz. bottles with full directions as to dose; and ung. pro mastitis, or summer weed ointment, which has proved its value in the treatment of a form of mastitis developed by heifers and dry cows when put out to pasture. The ointment is used as a preventive and, in addition to its soothing and healing properties, contains aromatic substances obnoxious to insects. Old favourites were notably displayed, such "Parophyroxia," for colic impaction; "Antithermogen," for inflammation, tendonitis, etc.; ung. iodermiol, the non-staining and non-irritating iodine ointment; "Elixir Hormonigen" for asthma and chorea in dogs; "Hormonigen" tablets for dogs and cattle where endocrine deficiency is indicated; while calcium-dextrose, in sterilised rubber-capped bottles and "ampuliques," confirmed the popularity of this treatment in calcium deficiency.

There was a large display of packed drugs, ready for dispensing, bearing the practitioner's name and address, the outer package giving the full title of the preparation, with its composition. These lines are daily growing in importance for the busy veterinary surgeon.

As usual, Messrs. Hewlett & Son gave special prominence to the section of vaccines, sera, bacterins and aggressins of the Bacteriological Institute, Tours; the Jensen-Salsbery Laboratories, U.S.A., and the Pasteur Institute, Paris. The steadily growing demand indicates that the progressive practitioner recognises the importance of vaccine therapy, which has been amply proved in many directions.

The International Serum Co. Ltd., Norwich, presented a comprehensive range of veterinary biologicals. Especial interest was shown in abortus chinosol vaccine, a new type of vaccine for the prevention and treatment of bovine contagious abortion which has been used with considerable success on the continent and is being increasingly employed in this country. "Suisan" is a polyvalent sero-vaccine for the treatment of the diseases of young pigs. For the treatment of canine diseases, canine distemper serum R.S.G., homologous distemper serum (obtained from dogs which have been hyper-immunised against the virus and the secondary organisms of distemper), and "Ergotropin" were shown. Homologous coli serum for dogs has also recently been introduced for the treatment of the bowel form of distemper. "Perlacar" was again on exhibit, and many practitioners have reported good results from the use of this preparation for skin diseases of dogs. In addition to their well-known gland preparation, "Hormal Fem. *c*. Yohimbin," for sterility, chinosol anti-sterility vaccine and "Citosan" vaginal leaves were shown for the first time.

Parke, Davis & Company, Beak Street, Regent Street, W.1, displayed a representative selection of veterinary serums and bacterins including tetanus antitoxin, anti-influenza serum (antistreptococcus serum, equine), for the prophylaxis and treatment of influenza and other febrile conditions of bacterial origin in horses and mules; anti-white scour serum; canine mixed bacterin for prophylaxis against infection from the bacteria associated with canine distemper, and canine mixed antigen—one of the immunogens suitable for the prophylaxis and treatment of canine distemper when the *B. bronchisepticus* and other secondary organisms are present. Blacklegoids and blackleg aggressin were also prominently displayed.

Among the purely pharmaceutical products displayed were "Nema" capsules, C-A worm capsules, flukoids, arecoline and chloretone capsules for tapeworm infestations in dogs, and chloretone and belladonna compound capsules for the relief of chorea in dogs and also for the symptomatic treatment of canine hysteria. The local anæsthetics "Parsetic" and "Codrenine" were also featured, as well as adrenalin and pituitrin, two products which have always been associated with the name of this firm.

Veterinary hypodermic tablets, compressed tablets and pills of various formulæ were displayed and a number of toilet preparations, including "Euthymol" tooth paste, which Messrs. Parke, Davis & Company manufacture, proved of interest to visitors of both sexes.

Sandoz Products, 5, Wigmore Street, London, W.1, exhibited their preparations, which now occupy a definite and established position in veterinary medicine.

Calcium Sandoz (calcium gluconate) was presented in its various forms as powder, tablets and solutions. The 10 per cent. and 20 per cent. solutions continue to enhance the reputation of the Sandoz firm in the treatment of milk fever. The single curative dose of 300 c.c. 20 per cent. solution, contained in an ampoule-flask with rubber cap, has proved of great value in meeting the needs of the practitioner in administering an adequate dose so necessary in calcium therapy treatment.

The 5 c.c. and 10 c.c. ampoules of 10 per cent. concentration devised for small animals have proved of great value in the treatment of diseases in dogs, while veterinary Calcium Sandoz powder in oral form has proved to be readily assimilable and supplies the necessary calcium element in the treatment of calcium deficiency diseases.

Lobeline Sandoz, displayed in the form of ampoules, is now an accepted respiratory stimulant against paralysis of respiration during anæsthesia.

Piroblue, exhibited in the form of powder, on account of low toxicity and high efficiency, has proved its value in the treatment of piroplasmosis.

Panthesine (N-diethyl-leucinol-ester of P. amido-benzoic acid) in ampoule and sterile solution forms, constitutes a local anæsthetic which is free from cocaine, rapid in action and gives prolonged anæsthesia marked by the absence of post-operative symptoms.

Panthesine Balm, containing five per cent. Panthesine in an emollient base was again displayed, and the remarkable effect of this ointment in overcoming acidosis and allaying pain has been proved by the increasing use of this product among veterinarians.

The Sandoz firm showed products of fully disclosed composition and characterised by originality. Careful research work marks the policy of this firm in endeavouring to produce products of definite therapeutic value.

Savory & Moore (Arnold & Sons), 50-53, Wigmore Street, London, W.1, report that their stand was well attended. Their exhibits included embryotomes of three different patterns, wire saws with ring handles, obstetric aprons, obstetric pulleys and obstetric hooks, Professor Wright's cat and dog anæsthetist's inhalers, œsophageal probangs, dog mouth gags, tooth scalers and teat instruments. The attraction centred round their new operating table. This table one can raise or lower with the simple touch of a pedal: also, the table can be moved round to any position without removing the base, by releasing a catch. The sides can be elevated so that the patient can lie in a trough; moreover, the table can be altered from a horizontal position to an elevation to any degree by releasing a wheel at the side. The great advantage of this table is that it can be placed in a small surgery and the operator can move round without any fear of kicking the legs. The price of this table can be obtained on application.

James Thin, Bookseller, 54-56, South Bridge, Edinburgh. This firm, which was established in the year 1848, was the only Scottish firm exhibiting at this Congress.

The stall, which contained all the latest books in veterinary science, including a complete range of the publications of Messrs. Baillière, Tindall & Cox, attracted much interest and was well patronised.

The book most in demand was the recently published "Practical Animal Husbandry" by William C. Miller, M.R.C.V.S., F.R.S.E., and Major E. D. S. Robertson, M.R.C.V.S.

The Anglo-American Pharmaceutical Co., Ltd., 59, Dingwall Road, Croydon, were represented with a well-arranged and most attractive exhibit.

Willows, Francis, Butler & Thompson, Shacklewell Lane, London, E.8. Year after year the old firm of Messrs. Willows, Francis, Butler & Thompson have been consistent exhibitors at our Congress since the commencement of this interesting adjunct to our proceedings, and they seem to have acquired the secret of perpetual youth. We have never seen an exhibit more tasteful and effective, and while doing justice to the merits of the old school of medicine and surgery, it showed all the benefits and advantages of the new.

Messrs. Willows have given special attention to the demands of mineral deficiency treatment and their "Dextro Calcium" and "Dextromag" in various convenient forms, occupied a prominent position. We are informed that the profession appreciates and uses these preparations to an extent far beyond the firm's highest expectations and the requirements increase almost weekly. The usual choice block of aloes barb. was shown, together with "Willows" chlorodyne, "Colodyne," "Dermatidine," anti-

The "Willows" Stand.

filarine, mist. bismuth salicyl co. (for scour in calves), liq. ferri quininæ co., "Plasmul" and many other of the standard preparations.

Amongst the recent articles brought out by the firm we noticed "Piromuth"—a method of dealing with Piroplasmosis by injection, and "Folliculin" for acute skin troubles in dogs.

Anæsthetics had a place of honour in Willows special anæsthetic chloroform for general, and "Chlorocain" for local anæsthesia. The latter appears to be the most largely used of its kind in the profession.

Sera and vaccines presented a most varied assortment; in this section our attention was drawn to a serum for swine erysipelas—"Erysan"—which has a great vogue, due to its efficiency and also economical advantages where used in large quantities.

The attention now given to canine and feline practice was fully provided for. Various vermifuges were shown and we understand that "Willows Tenaline" is holding its own. It is now put up in elixir form—a palatable and elegant preparation. Dressings to meet every form of skin disease were finely displayed, as well as many convenient items for the "dog's toilet."

Numerous remedies in tablet form appeared and it is interesting to hear that "Willows Cerestan" tablets have secured a reputation in dealing with interdigital cysts, and pustular eruptions generally.

The Surgical Instrument section was distinguished not only by its variety but by the numerous forms in which electricity appeared as the handmaid of the surgeon.

The "Euthanator" used in a remarkable method of destroying dogs painlessly created great interest and was demonstrated practically.

We would conclude this brief survey of Messrs. Willows' exhibit by recording the fact that many members expressed the utmost admiration for this firm's splendid contribution to the interest of the Congress.

The Balfour Hostel.

LADIES' VETERINARY BENEVOLENT GUILD

ANNUAL GENERAL MEETING

The third Annual General Meeting of the Ladies' Benevolent Guild was held on Wednesday, August 1st, 1934, at 12 noon, in the Royal (Dick) Veterinary College.

Mrs. J. G. McGregor, President of the Guild, occupied the Chair and 42 ladies signed the attendance book. Major-General Sir John Moore was also present in his capacity of Hon. Auditor. The Acting Secretary announced the receipt of a number of apologies for absence.

In the absence of Miss Sheather, Hon. General Secretary, Mrs. Mitchell read the minutes of the second General Meeting, 1933. These were approved.

Mrs. Mitchell now presented the Hon. Secretary and Treasurer's Report, which had been sent on by Miss Sheather. From this it was learned that during 1933-34, 44 ladies have joined the Guild, bringing the membership to 262. Mrs. McAllan has kindly consented to act as Representative of Northern Ireland.

The Financial Statement was also read and found satisfactory.

Mrs. McGregor then read letters from the Hon. Secretaries of the Victoria Veterinary Benevolent Fund and the National Veterinary Benevolent and Mutual Defence Society, returning grateful thanks for the donations sent.

The reports of the Secretary and Treasurer were then approved.

ELECTION OF OFFICERS

The following officers were then elected for the ensuing year.

President.—Mrs. McLean, Belfast.

Vice-Presidents.—Mrs. Male, Mrs. Simpson, Mrs. Wynn Lloyd, Mrs. Begg, Mrs. Cumming, Mrs. McAllan, and Mrs. Dolan.

Hon. Secretary and Treasurer.—Mrs. Nickinson was elected to this office.

On the motion of the President, a hearty vote of thanks was accorded to Miss Kitty Sheather for her past services.

Hon. Auditor.—Major-General Sir John Moore was elected and thanks were rendered to him for his services and help. In accepting the office, he intimated that he wished to give a donation of £1 1s. to the Fund.

It was intimated that a substantial sum had been raised by the Scottish Branch members, which, together with the proceeds from the Dance to be held on August 2nd, would be forwarded to the Treasurer.

The meeting concluded with a vote of thanks proposed by Mrs. Male, to Mrs. McGregor for her conduct in the Chair and her splendid efforts throughout the year. Mrs. Nickinson proposed a vote of thanks to Mrs. Mitchell.

PROFESSOR JAMES FERGUSON CRAIG, M.A., M.R.C.V.S.

President, N.V.M.A., 1934-35

The Council of the National Veterinary Medical Association are to be congratulated on their choice of Professor Craig for the responsible position of President of the Association for the current year. The choice is a particularly happy one on this occasion, when the Annual Congress will be held in Belfast.

Professor Craig's personal and professional attainments are so well known and highly esteemed amongst the members of the profession in both Great Britain and Ireland that a biographical sketch of his career seems almost superfluous. From his school days his career has been marked by progressive distinctions. He gained a County Bursary in his local school and entered Glasgow University, where he graduated M.A. Choosing the Veterinary Profession as his calling, he commenced his studies at the Glasgow Veterinary College, where the first two years of the curriculum were spent. He finished his course at the Royal Veterinary College, where he gained a long list of distinctions.

He was chosen as tutor in Medicine at the College after obtaining his diploma (1902-3), and in 1903 he was appointed Professor of Anatomy and Histology in the Veterinary College of Ireland. In 1908 he succeeded Professor Wooldridge as Professor of Veterinary Medicine and Parasitology at the same college, while in 1919, following the death of Professor Mettam, he was appointed as Principal—a position for which he has proved himself admirably fitted. His genial, unassuming disposition and his native tact have caused the happiest relations between himself and the staff and students of the college.

It may be justly claimed that the Irish college has proved to be a successful teaching institution and its success is in no small part due to the wise guidance of the Principal. His personal efforts on behalf of the students include the promotion of their sports as well as their studies. The pains he takes with morbid specimens and giving advice on various professional matters have proved a boon to the general practitioners, who thoroughly appreciate the help they receive in this way.

Veterinary Literature has been enriched by his many scientific and clinical contributions, which are too numerous to mention here. Amongst his principal treatises are the following:—

(1) Abnormal Genital Organs in the Domesticated Animals. *Jour. Comp. Path. & Ther.*, Vol. 18, March, 1905, p. 57.

(2) Investigations as to the Poisonous Nature of Common Sorrel (*Rumex acetosa* Lacin). Craig and Kehoe. *Ibid.*, Vol. 34, March, 1921, p. 27.

(3) Cirrhosis of the Liver in the Horse. Craig and Kehoe. *Ibid.*, March, 1921, p. 35.

(4) Horse Pox and Costal Exanthema. Craig and Kehoe. *Ibid.*, June, 1921, p. 126.

(5) Outbreak of Contagious Abortion in an Irish Dairy Herd. Craig and Kehoe. *Ibid.*, Vol. 35, December, 1922, p. 257.

(6) The Use of Drugs in the Treatment of Disease caused by Nematode Worms. International Veterinary Congress, 1914.

(7) Some Notes on the Passage of Fluids through the Stomachs of Ruminants. *Veterinary Journal*, Vol. 67, November, 1911, p. 655.

(8) Bursæ and Sheaths in the Horse. *Ibid.*, September, 1907.

(9) Lymphatic Glands in the Ox. *Ibid.*, June, 1909, Vol. 65, p. 279.

(10) Poisoning of Poultry by Arsenic, Phosphorous and Common Salt. *Ibid.*

(11) Notes on Two Surgical Areas in the Horse—Plantar Nerves—Facial Sinuses. *Veterinary Record*, Vol. 18, 1905, pp. 219 and 223.

(12) The Presence of Psoroptes in the Ears of Sheep. *Ibid.*, Vol. 39, 1917, p. 503.

(13) Intestinal Coccidiosis in Cattle. *Ibid.*, Vol. 32, July, 1919, p. 11.

(14) Roaring and Whistling. *Ibid.*, Vol. 24, July, 1911, p. 195.

(15) Chronic Hæmaturia of Cattle. *Ibid.*, Vol. 10, 1930, p. 68.

(16) Ragwort Poisoning in Cattle and Cirrhosis of the Liver in the Horse. Craig, Kearney and Timoney. Ibid., p. 159.

(17) Plant Poisoning. Craig and Kehoe. Annual Congress N.V.M.A., Dublin, 1926.

(18) Articles in Wallis Hoare's "Veterinary Medicine": (*a*) Contagious Bovine Pleuropneumonia; (*b*) British Red Water; (*c*) Ovine Piroplasmosis.

(19) Articles in Wooldridge's "Encyclopædia of Veterinary Medicine": (*a*) Mange Mites and Mange; (*b*) Blood-sucking Flies.

(20) Blackhead in Turkeys. Fourth World's Poultry Congress, July, 1930.

(21) Bovine Tuberculosis and its Eradication. Congress Irish Shorthorn Society, 1928.

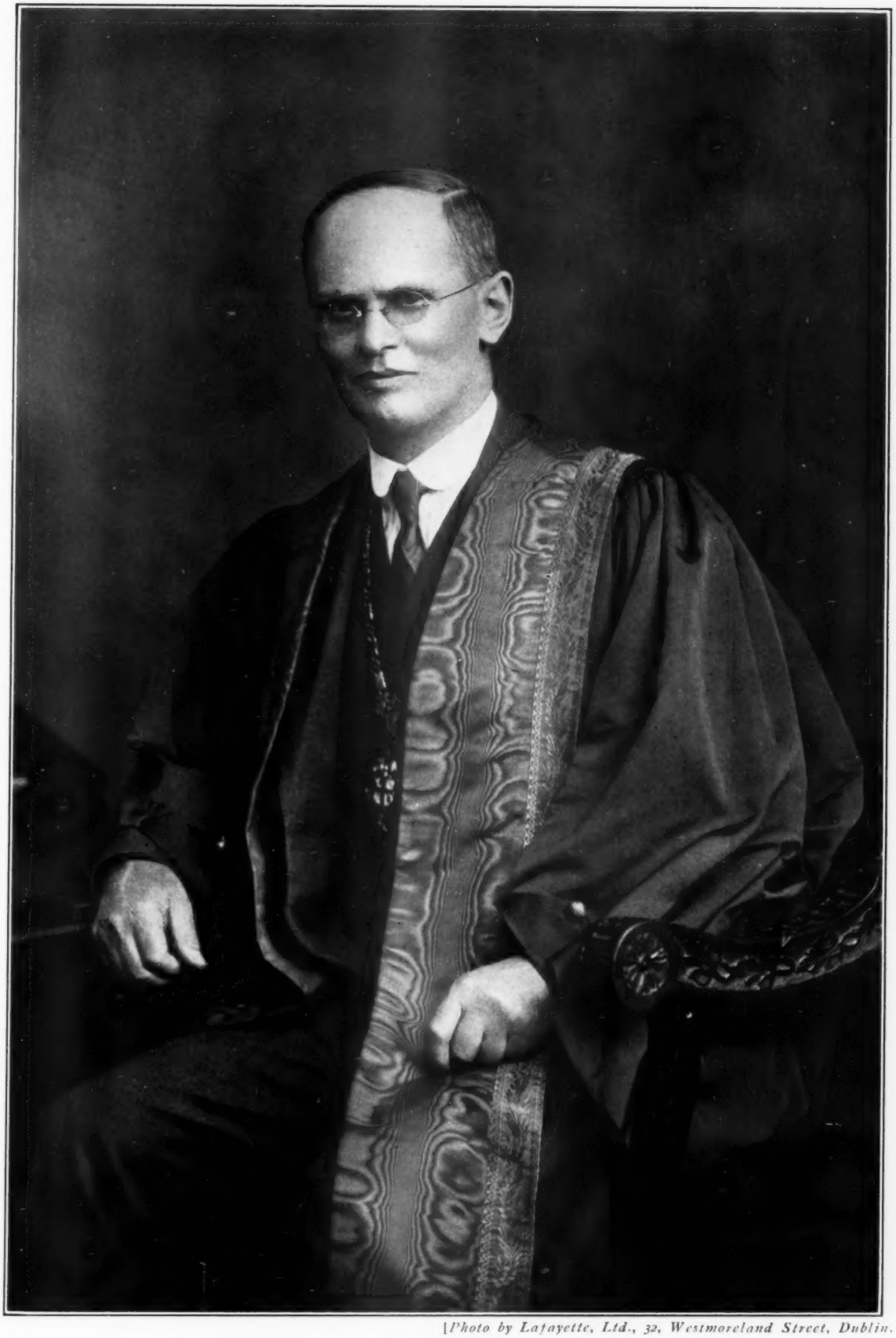
(22) Contagious Abortion in Cattle. *Journal Dept. of Agriculture for Ireland*, Vol. 27, No. 3.

He also edited and revised the third and fourth editions of Fleming's "Veterinary Obstetrics."

Professor Craig has acted as External Examiner in Anatomy for the B.Sc. degree at the Royal Veterinary College in Medicine; for the B.V.Sc. degree in Liverpool; as Examiner in Hygiene for the B.Sc. in Agriculture in Queen's University, Belfast, and for the degree of A.R.C.Sc. Ireland.

He is a member of the Royal Irish Academy and a member of the Council of the Royal Zoological Society of Ireland and a past-President of the Veterinary Medical Association of Ireland. He gave evidence before the Departmental Committee on the Milk Supply and acted on the committee appointed to consider the differential diagnosis of foot-and-mouth disease.

In 1930 Principal Craig received the greatest honour which his confrères in the profession could bestow upon him, when he was elected President of the Royal College of Veterinary Surgeons—a position which he filled with



[*Photo by Lafayette, Ltd., 32, Westmoreland Street, Dublin.*

PROFESSOR J. F. CRAIG, M.A., M.R.C.V.S.

President of the National Veterinary Medical Association of Great Britain and Ireland, 1934-35.

CLOSING MEETING

(ADJOURNED ANNUAL GENERAL MEETING)

Professor Craig's Induction

PRESENTATIONS AND VOTES OF THANKS

There was a large attendance of delegates and their ladies at the closing meeting of Congress (adjourned Annual General Meeting), which was held in the Royal (Dick) Veterinary College Hall, Edinburgh, on the afternoon of Friday, August 3rd.

At the commencement of the proceedings the President (Mr. W. Nairn, Blairgowrie), who was in the Chair, said: We have now reached the stage of our programme when it is necessary that there should be an early departure by our members, including the retiring President. As you know, I have been appointed to represent the Association in New York, as a delegate of the "National." (Applause.) I shall take with me the greetings of this Association to our friends across the Atlantic and I am sure you will wish me to express these greetings as cordially as possible to the various members whom we meet in America. (Hear, hear, and applause.) Our train departs from Edinburgh (Princes Street Station)—well, I should not have mentioned the station, because some of our young friends want to see us off—at 4.30 and you will understand that I will require to leave the proceedings early. I do not know how long some of you will wish to detain my successor in office. (Laughter.)

Presentations to the Local Secretaries

Proceeding, the President observed: I am sure it must have struck all of you at this Congress that it has run very smoothly. The organisation has been wonderful, if not perfect (applause), and has undoubtedly added very greatly to your pleasure and I must say has added exceedingly to mine, and I am personally very grateful to our local secretaries who have done so much to make the Congress pleasant for you all and very pleasant and happy for me. (Hear, hear, and applause.) I, on your behalf, will now express our high appreciation of these services and convey to our local secretaries small mementoes, not as a measure of appreciation, but rather that they may recall in later days this pleasant occasion and the pleasure and joy which they have given to members of this Congress. (Applause.) I would ask Mr. and Mrs. Ritchie to come up to the platform. (Renewed applause.) Mr. Ritchie, by your labour of love during the past months and especially during this week you have laid us under a deep debt, and I would ask you to accept this silver tea service and I hope that you will enjoy long life and happiness and that when you and Mrs. Ritchie sit down together to have your cup of tea you will recall, with great pleasure, this occasion. (Loud applause.)

Mr. J. N. Ritchie (Edinburgh): I hardly know how to thank you for this wonderful present, nor how to thank the President for the very kind words which he has used in making the presentation. It would be useless to say that there has not been a good deal of work in connection with the Congress, but it has been greatly lessened by the very great number of eager workers on the Provisional Committee. I would venture to suggest, however, that this Congress will not go down in our memories because of any arrangements which the Provisional Committee has made but rather as the Congress at which John Grant won the Cup and Steele Bodger reached the top of the League. (Laughter and applause.) I would once again thank you very much, on behalf of my wife and myself, for this wonderful presentation.

The President: I would now ask Dr. Gordon to come to the platform—unfortunately Dr. Gordon cannot bring to the platform with him his wife, but in handing this gift to him I would wish him long life and success in that life—a success which he richly deserves, as I am sure every member of this Congress will agree. (Loud applause.)

[The President presented to Dr. Gordon a silver wristlet watch.]

Dr. W. S. Gordon (Gilmerton): I feel like the nervous political candidate who, when addressing his constituency for the first time, commenced by saying "Why am I here? Why am I here?" and a pitiful voice from the back of the audience said "Goodness knows." (Laughter.) I feel that the N.V.M.A. in choosing as their local secretary Mr. Ritchie had really no necessity to appoint me to assist him, because he has organised the whole of the proceedings himself. Any little duties that I have had to carry out have been a pleasure, and I have been only to glad to do them. I thank you very

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marked distinction—and in deference to the wishes of his Irish professional colleagues he obtained the consent of the Council to hold the Annual Dinner of the Royal College in Dublin. The large number who attended the dinner have very pleasant recollections of that successful function. In 1931 Sir John M'Fadyean, on behalf of the Council of the Royal College, presented him with the John Henry Steel Medal awarded in recognition of the great work done for the advancement of the Veterinary Profession.

Notwithstanding all the honours that have been showered upon him, he remains the same "Joey" Craig as he has been for long affectionately known by the students and graduates of the Dublin Veterinary College.

much indeed for this memento, which I will cherish as long as I live. (Loud applause.)

Induction of President

The President: And now, ladies and gentlemen, the last stage in my career as President approaches. In a few moments I will return to the crowd, as one of the ordinary members of the Association. That thought is tinged with some sadness, I admit, because I have been privileged during my year of office to enjoy many blessings. I have met many friends and made many friends, and I hope it will lead to friendships which will last over the years. I can, however, depart from office confident in the thought that I leave behind me a very worthy successor. (Loud applause.) Professor Craig has already occupied the distinguished position of President of the Royal College of Veterinary Surgeons, and I need not weary you with any eulogy of his qualities. I have found him to be a good friend as well as a distinguished member of his profession, and I have much pleasure in placing the robes and chain of office on his shoulders. I would ask Professor Craig to stand while I do so.

[The retiring President installed Professor J. F. Craig, the President-Elect, into office by placing upon him the robes and chain of President.]

Professor Craig, you have been elected by the unanimous vote of the members of this National Association in General Meeting, and I would point out to you that that is the highest honour which the Association can confer upon any of its members, but I know, from my knowledge and experience of you that you will discharge the duties of the office with dignity and credit and in a manner worthy of the traditions of the office. I would wish you a successful and happy year in office. (Loud applause.) Ladies and gentlemen, I present to you, now, your President, and would ask him to assume the duties forthwith. (Renewed applause.)

[Professor J. F. Craig assumed office as President.]

The President (Professor Craig) (Dublin): May I be permitted to say again how highly I appreciate the great honour which you have conferred upon me in unanimously electing me as President of this Association. I realise, as your past President has stated, how great the honour is and that it is the highest gift that is possible for this Association to bestow upon one of its members. I am fully conscious that I shall have at times to labour under certain disabilities—and those disabilities were common, also, to my predecessor—namely, those of time and distance. Fortunately we have in the profession a small coterie of able workers who have given their time and services freely in the interests of the Association and its work. This is a great and growing Association and one realises that it can become a very powerful influence for good not only in the Association but in the interest of veterinary science, and one therefore feels, at times, that very great care must be taken in the direction in which its energies are being exerted. I hope that during my year of office the confidence which you have placed in me shall be merited. This is not the time or place to indicate what shall be done, but I would like to suggest to you that in order that our Association shall go in the way we would like, we should have the loyal support, the loyal co-operation and the sympathetic interest of all the members in the labours that are associated with the work of the Association and its decisions and endeavours. I think that is the most important thing that will enable the Association to have full effect. Next year we are having a Congress in Belfast. We have, as our guide, what has been done in Edinburgh and at other previous congresses—and this is one of the most successful Congresses that have ever been held (hear, hear, and applause)—and those of us who live on the other side hope we will have an equally successful Congress in Belfast, and we trust and hope that as many of you as possible will come and attend that Congress, to make it a success. (Applause.) I understand that any speech that is to be given by the President must be given at the end of his term of office, and, therefore, with these few remarks I will get on with the business of the meeting.

The second item on the agenda is headed "Matters that have arisen during the Congress." I do not know of any matters that require to be referred to in that connection, but perhaps some members may have matters that have arisen during the course of the Congress to bring before this meeting. . . . Apparently there is no matter of that nature, so we will go on to the third item on the agenda, namely Resolutions. I would ask the Secretary to read one resolution that was passed by sectional meeting.

RESOLUTION

The Secretary: This is a resolution from a sectional meeting on the paper "White Scour and Allied Diseases in Calves": "That a small Committee be formed to consider the possibility of the National Veterinary Medical Association taking steps in conjunction with the National Farmers' Union of Scotland to formulate an organised programme of research into White Scour and Allied Diseases of Calves."

The President: The resolution was passed at a sectional meeting, and the question now is as to what will be done with it. Perhaps the Chairman of that sectional meeting is present and I would suggest to him that the best course to

adopt would be to remit the resolution for consideration by Council and the Council can then consider what would be the best course to adopt to formulate a programme to deal with the matter proposed.

Major Andrew Spreull (Dundee): I think the President has stated exactly what is wanted to be done, namely, that we would like the matter brought before the Council and the Council to appoint a Committee to go into it. As the Committee will be working with the Scottish Farmers' Union, I would suggest that members of Council should endeavour to see that a certain number of Scottish members are on the Committee. That would make it so much easier for them to work along with the Scottish Farmers' Union. If I am in order, I would like to suggest possible Scottish members: first, our retiring President; Mr. Nairn; Mr. Gordon, of the Animal Diseases Research Association; Mr. Hugh Begg; Captain James Anderson, of Keith, and the reader of the paper, Mr. Smith.

Mr. Gofton (Edinburgh): I beg to suggest that you add the the name of Dr. Russell Greig. (Applause.)

The President: Well, ladies and gentlemen, you have heard the suggestion made by Major Spreull. Do I take it you are all agreed to it? (Agreed.)

The Retiring President Thanked

The fourth item on the agenda (proceeded Professor Craig), has reference to Votes of Thanks. The first of these it is my privilege to propose and it is one which is exceedingly pleasant to me and which will be received, I am sure, most enthusiastically. It is that of the retiring President. (Hear, hear, and loud applause.) I am sure you do not wish me to tell you how long I have known him, nor do you wish me to tell you what his good qualities are and what the nature of the services which he has rendered is. They are all well-known to you and one can only hope that he will continue the good work that he has been doing not only as President but prior to that, and that we will have the advantage of his advice and services for many years to come. I put it to you, ladies and gentlemen, that this vote should be carried enthusiastically and the evidence of that given in the usual way. (Renewed loud applause.) Mr. Nairn, you have heard the evidence of the appreciation of your services that this meeting extends to you. That is the only means we have of indicating our approval of what you have done, but together with the acclamation we hope that you will appreciate that we realise what you have done for and on behalf of the Association.

Mr. W. Nairn: I need hardly add that I am deeply touched by your generous expression of thanks. My wife and I regard this week especially as one of the most wonderful in our lives and I would thank you all for the great kindness which you have shown to us on this occasion. May I just say that, despite a considerable amount of hard work, despite the distance that I have been from London, and despite other difficulties that have arisen, I have enjoyed my work as President of the "National," because I felt that I was helping to steer the ship of our profession onwards, if the course was not exactly as straight as we wished, and I would say, before I leave the Chair, that your best tribute to me and to my service, if you consider it worthy, would be to continue the pleasant relationship that exists at present. I am not disturbed by little upheavals occurring here and there, because I know that members of my profession have sufficient good sense to recognise the course that leads to progress and good work on the nation's behalf. (Applause.) I need not delay you with a long speech. You have heard, I am sure, too many of mine during this week, and I am not a gifted orator, but I would just thank you again, on behalf of my wife and myself, for having given to us an experience that will be a sweet memory for the rest of our days, and may I say, in the words of our National bard:

"When life's dark stream I ferry o'er,
A time that will surely come,
I'll ask no more from Heaven itself
Than just a National welcome."

(Loud applause.)

The President: May I add to the vote of thanks to our retiring President that we wish him, as he suggested, to convey the greetings of this Association to the International Veterinary Congress and that we also wish that not only he but the other representatives and their wives, who are going with them, will have a pleasant time while they are there and also an interesting discussion and an interesting week during the Congress. We hope that they will come back and indicate to us what will be of profit to us, if not of other interest. We know that the time is short for them, on this side, but we do not want them to go away without the feeling that they carry with them the best wishes of this Association. (Applause.)

I have next to propose a vote of thanks to the various retiring officers. That will include, although they are not retiring officers, the Honorary Secretary and the Honorary Treasurer. You know what work these officers do. You know how well the Treasurer looks after our interests. We hope that he will continue long in the office and will continue the good work. As to the Honorary Secretary, his work is continuous. If it is intermittent at all, the intermissions are very short. We trust they will accept our heartiest thanks for the work

which they have done and I would ask you, ladies and gentlemen, to confirm the vote which I am proposing, in the usual way. (Loud applause.)

Major J. G. McGregor (Stirling): I have been asked to propose a hearty vote of thanks to the Corporation of Edinburgh for according the Association an official welcome and a Civic Reception. It is unnecessary for me to enlarge on the theme of our deep indebtedness to the Corporation for all they have done for us during this week. We have enjoyed their splendid hospitality and their cordial welcome and I would ask you to mark your appreciation by according them a very hearty vote of thanks. (Loud applause.)

The President: It is now my privilege—I might say my duty—to refer to the facilities which have been granted by the Governors and Principal of the Royal (Dick) Veterinary College in connection with this Congress. I need hardly assure them that these facilities have been greatly enjoyed and that they have added greatly to the success of the meeting. (Applause.) It is evident that a very great deal of labour has been expended by the Principal and his Staff in making the preparations for the holding of the Congress here. (Renewed applause.) Moreover, we have had wonderful demonstrations in some subjects of very great interest, splendidly arranged in the Museum, and I hope that Dr. Bradley understands that these facilities have been thoroughly appreciated by the members who have attended the Congress. I now ask you to confirm this vote of thanks to the Governors and Principal of the Royal (Dick) Veterinary College. (Loud applause.)

The President, proceeding, said: I want to add something that is separate altogether from that, and it is with reference to the informal "At Home" which was so kindly arranged and so generously given by Dr. Bradley. It was a very happy thought—just one of the things which Dr. Bradley takes in hand and which makes all the difference. (Hear, hear.) I would ask you to pass a hearty vote of thanks for that joyous little happening in connection with this Congress. (Loud applause.)

Dr. O. C. Bradley (Principal, Royal (Dick) Veterinary College): As I indicated on Sunday, it is really a matter of supererogation to thank the person who derives the most enjoyment. (Applause.)

Mr. Arthur Gofton (Edinburgh): I have to ask you to accord a very hearty vote of thanks to the Presidents and Vice-Presidents of Sections, the Recording Secretaries, readers of papers, openers of discussions, operators and demonstrators, and I may say that, putting the matter at its lowest level, this resolution deserves every support by reason of its comprehensiveness, apart from everything else. You will all agree with me that these gentlemen deserve our very hearty thanks for their great and successful efforts on behalf of this Congress. (Loud Applause.)

Mr. Hugh Begg (Hamilton): I would ask you to accord a vote of thanks with the most profound pleasure, and that is that you should voice a sense of your indebtedness to the Edinburgh Association for the provision of hostels for women students, and for granting accommodation to us at the Balfour Hostel. My pleasure is all the greater because I was one of the beneficiaries and I can assure you that none had a better place to stay in than we had. Everything was first class, and each of us when we rose in the morning just imagined that the massenet was his own. (Applause.)

The President: These votes of thanks, of course, will be forwarded in the usual way to the persons or organisations to whom they have been voted. There is now one by Mr. McIntosh.

Mr. J. W. McIntosh: I have been entrusted with the very important and pleasant duty of asking you to accord to our Provisional Committee, the local Honorary Secretary, Mr. J. M. Ritchie, the Assistant Local Secretary, Dr. W. S. Gordon, and the Ladies Committee a hearty vote of thanks. Now, I think we must all agree that this year's Congress has been one of the most successful that most of us have experienced—except, perhaps, the one held in 1928, to be personal. (Laughter and applause.) It was what we expected in Scotland. When Scotsmen and Scottish ladies take a matter in hand, they take some beating, I can assure you, and I know a little bit about Scotland. The arrangements made by the Provisional Committee have been exceptional on this occasion. Edinburgh, of course, has its attractions, but without the work of the Provisional Committee and all those associated with it—the Local Secretary and his assistant—the Congress would not have been the success that it has been. The spade work has been done and done well, and I am sure we are very much indebted to these people who have assisted in making the Congress a success, and I would ask you to join with me in according to them a very sincere and cordial vote of thanks. (Loud applause.)

Mr. W. Jackson Young (Newcastle-upon Tyne): I have much pleasure in proposing that a most cordial vote of thanks be awarded to the various Golf Clubs who granted facilities for members to use their courses during the Congress week. These facilities were very greatly appreciated. (Hear, hear.)

I have also to ask you to pass a hearty vote of thanks to the Press for the publicity they have given to the proceedings of this Congress. (Applause.)

The President: It is not on the agenda but Mr. Jackson Young wishes to raise a question.

Mr. Jackson Young: I shall not detain you very long. Many of you know that I have a very great thirst for knowledge and information. I have encountered a conundrum in connection with this Association and to me it is a conundrum, and I should like, while we have an Annual Meeting of members, to have an answer to the conundrum. We are favoured here to-day with the presence of our solicitor, and it is more or less a legal question. I have a very great interest, as you all know, in the Association. I am one of its few life members, and I can look back to the days when we were a very very small party that could occupy two horse-drawn brakes on our excursions. My conundrum is in connection with the membership of the Association. The objects of the Association are to hold meetings of members of the Association or of the branches and divisions. I fully realise what a member of the Association is. I fully realise what a member of a division is, but I am in trouble as to what constitutes a member of a branch. I know that there are members of the " National " who are not members of divisions. Until recently I was one of these. It was only recently that I became a member of a division. (" Shame.") It is not. I should like to ask our solicitor, whom we are very pleased to see with us at this closing meeting, if he could kindly inform the members and myself as to what constitutes a member of a branch.

The President: I do not know if Mr. Langley is in a position to answer that question at the moment.

Mr. Langley: A member of a branch is a member elected to that branch. What I understand Mr. Young to be asking is whether a member of the Association is automatically the member of a branch. Well, he is not. He has to be elected to a division and the divisions within a certain area constitute a branch. Is that your point?

Mr. Young: No. My point is if he is not a member of a division how can be become attached to a branch?

Mr. Langley: He cannot.

Mr. Young: Then what is the good of a man's being a member of the " National," if he is not a member of a branch?

Mr. Langley: That is for him, entirely. That is his own neglect, and his fault.

Mr. Young: I thank you for your ruling. I was afraid you were going to take it to *avizandum*, but you have given the ruling here and now, and I thank you for the information.

Declaration of Close of Congress

The President: That concludes the business of the meeting and the Congress, and I now declare the meeting and the Congress closed.

POST CONGRESS MEETING OF COUNCIL

The first meeting of the Council elected to officiate for the year 1934-35, was held in the Royal (Dick) Veterinary College, Edinburgh, on the afternoon of Friday, August 3rd, following the closing meeting of Congress.

The newly-elected President, Professor J. F. Craig, occupied the Chair, and there were also present: Messrs. H. W. Steele Bodger, David Brown, Esmond Brown, H. E. Bywater, Prof. J. F. Craig, Lt.-Col. J. A. Dixon, Messrs. P. F. Dolan, John Holroyd, Major H. Kirk, Messrs. H. G. Lamont, G. P. Male, J. W. McIntosh, Sir John Moore, Capt. S. J. Motton, Capt. A. W. Noel Pillers, Messrs. G. W. A. Sangster, S. Sharp, Capt. R. Simpson, Major Andrew Spreull, Mr. T. Wilkinson, and Dr. W. R. Wooldridge.

The Secretary announced the receipt of apologies for absence from the following:— Capt. J. R. Barker, Capt. H. S. Cockburn, Capt. J. C. Coleman, Mr. H. W. Dawes, Major A. C. Duncan, Mr. George Eaton, Mr. E. P. Edwards, Mr. J. W. Hall Masheter, Mr. G. T. Matthews, Mr. R. Barons Nelder, Mr. H. L. Roberts, Lt.-Col. P. J. Simpson, Capt. R. Simpson, Major F. J. Taylor, Major J. H. Taylor, Mr. J. Willett, Mr. Wm. Woods and Prof. G. H. Wooldridge.

The Secretary stated the purpose of the meeting was to elect Standing Committees of the Association for the ensuing year, and to deal with any matters which had arisen during the Congress and which required immediate attention. In previous years a Committee had been appointed to make nominations to the October meeting of Council.

It having been agreed that a Nominations Committee be appointed, it was decided, after some discussion, that this be constituted as follows:—

The President, the Honorary Officers, the Chairmen of Standing Committees and

(1) *As representing General Practitioners*: Messrs. J. R. Barker, H. W. Steele Bodger, E. P. Edwards.

(2) *As representing Part-time Veterinary Officers*: Messrs. H. W. Dawes, R. H. H. Over, S. J. Motton, J. Holroyd.

(3) *As representing Whole-time Officers*: Messrs. J. A. Dixon, D. S. Rabagliati, R. Simpson, W. Tweed.

Dr. W. R. Wooldridge was also appointed to serve.

The Secretary stated that, since the appointment of a deputation to interview the Banff County Council in regard to the inadequate salary offered for the post of Veterinary Officer,

the question had been raised as to whether the expenses of the deputation would be met by the Association.

Council assented to the payment of third-class travelling expenses, in view of the urgency of the matter.

Mr. W. C. Miller drew the attention of the Council to the conditions of appointment and duties of the post of Lecturer in Animal Hygiene in the Agricultural Education Department of the Derbyshire County Council, rendered vacant by the pending departure of Dr. G. B. Brook, M.R.C.V.S., who undertook the duties in his capacity of Veterinary Education Officer. It was understood that this post was being advertised in the lay press, but it was obvious from the duties specified (said Mr. Miller) that the post could not be filled satisfactorily by other than a member of the veterinary profession.

The Council, having heard the terms and conditions of appointment, concurred in the the view expressed by Dr. Miller, and decided that a letter should be addressed to the Director of Education, Derbyshire County Council, in the matter.

The drafting of this letter was left in the hands of the President and the Secretary.

Under "Any Other Business" Major Kirk suggested that the Association should secure a microphone for use at subsequent Congresses. It was agreed that this matter should be referred to the Finance Committee.

Major Kirk gave notice that, at the next meeting of Council, he would move: "That, in view of the increasingly heavy expenditure incurred by the President of the Association in the fulfilment of his duties during his year of office, and particularly in connection with the Annual Congress, the sum granted by the Association towards these expenses be reviewed."

The meeting then terminated, with the according of a vote of thanks to the President for his conduct of the proceedings.

ZOOLOGICAL SOCIETY SECRETARYSHIP

It was announced in the report of the council for July, at the monthly general meeting of the Zoological Society of London, held recently, that Sir Peters Chalmers Mitchell, who has been secretary of the society since 1903, will retire at the annual general meeting next year.

The council selected Mr. Julian Sorell Huxley, lately Professor at King's College, who has accepted the nomination and will be recommended by the council for election at the annual meeting next April. He has undertaken to assist the secretary voluntarily this autumn, and the council has arranged for him to be on full duty with the secretary for the month of April next year.

PAPERS PRESENTED TO CONGRESS

In this and succeeding issues of the Association's journal publication will be made of all the papers presented to Congress, together with the discussions upon them, in the order in which they were considered.

This special Congress Number contains the contribution to the Veterinary Medicine and Surgery Section, "White Scour and Allied Diseases in Calves," by Mr. R. McD. Smith, M.R.C.V.S., of Galston, and that to the Experimental Pathology Section, "Entero-toxæmia in Herbivorous Animals—its possible bearing on Grass Sickness in Horses," by Dr. W. S. Gordon, PH.D., M.R.C.V.S., Edinburgh.

Future issues of the *Record* will contain the following papers, with reports of discussions: "The Application of Biochemistry to Veterinary Practice and Research" (Experimental Pathology Section), by Dr. H. Dryerre, M.R.C.S., L.R.C.P., of Edinburgh; "The Eradication of Bovine Tuberculosis" (Public Health Section), by Major A. Douglas, M.R.C.V.S., D.V.S.M., of Ayr; "Non-Parasitic Diseases of Dogs" (Veterinary Medicine and Surgery Section), by Mr. J. L. Cormack, M.R.C.V.S., of Coventry; and "Distemper of the Cat" (Veterinary Medicine and Surgery Section), by Major T. Dalling, M.R.C.V.S., of Beckenham.

No. 1—WHITE SCOUR AND ALLIED DISEASES IN CALVES*

R. McD. SMITH, M.R.C.V.S.
Galston, Ayrshire

I understand that when the question of subjects for discussion at the Congress was brought up, the reason for choosing this paper was that, in the opinion of the Provisional Committee, the subject of calf diseases was one which might be of interest not only to practitioners but to laboratory workers as well.

It must be admitted that from an economic aspect alone the subject is of such considerable importance as to warrant further recognition. Very little work has been undertaken to combat calf diseases, and I feel that I am not the only practitioner who is harassed by this trouble. It is true the extent of the damage done should be known, consequently an airing at the Congress may bring forth much evidence from many practitioners as to the extent of the mortality, and better ideas with regard to the nature of the disease may be obtained as a result of the information brought to light by this discussion.

From questionnaires distributed amongst my clients since 1931 up till the spring of 1934 the

*Presented to the Veterinary Medicine and Surgery Section, N.V.M.A. Congress, Edinburgh, July 30th, 1934.

following data have been collected. Some calves showed symptoms of white scour, others those of navel-ill or joint-ill, whilst yet others showed symptoms of both, and again a large number died from conditions which may have been a form of either but with typical symptoms of neither condition. As the diagnosis of the condition present depended more or less wholly on the client's own observations the following statistics can only be assumed to be fairly accurate, but in my opinion they are none the less valuable. Fifty-two farmers throughout Ayrshire tabulated their experiences, showing that 90 per cent. suffered losses in calves as follows:—

Total Average Annual Death-rate from all Causes—20 per cent., consisting of

(a) White scour ... ... 40 per cent.
(b) Navel-ill or joint-ill 50 do.
(c) Other diseases ... 10 do.

Seasonal Variation—(1) *Spring Months* death-rate from all causes 25 per cent., consisting of

(a) White scour ... ... 60 per cent.
(b) Navel-ill or joint-ill 34 do.
(c) Other diseases ... 6 do.

(2) *Autumn Months* death-rate from all causes 8 per cent., consisting of

(a) White scour ... ... 12 per cent.
(b) Navel-ill or joint-ill 60 do.
(c) Other diseases ... 28 do.

In some instances scouring from other causes may have been included. "Other diseases" comprised conditions not classified by the farmers. The above figures only take into account the death-rate of heifer calves, since in Ayrshire bull calves in most instances are sold within a few days of birth.

As there are over 1,600 dairy herds in Ayrshire the annual loss through calf diseases is enormous, and there is no reason to doubt that similar losses are encountered in other parts of the country. Financially the loss must amount to thousands of pounds annually, whilst these conditions constitute an incalculable scourge in self-contained herds.

The foregoing statements afford ample proof of the prevalence of such diseases, and the following outstanding features were also gathered during the investigation:—

Calves became affected from a few hours after birth up to one month. Those affected with white scour showed symptoms earlier than those affected with navel- or joint-ill. In some cases death took place shortly after the first symptoms were noticed. Calves, apparently healthy at night, were found dead on the following morning, without any symptoms having been noticed, the lesions here being only found on *post-mortem* examination.

The course of the diseases varied in individual calves as well as on individual farms. Those calves in which the disease or diseases appeared soon after birth succumbed quicker than those which contracted the diseases later on. Those which survived were generally unthrifty for a considerable period.

SYMPTOMS OF DISEASES

White Scour.—A condition known by the characteristic chalky, putty-like condition of the fæces. The diarrhœa may be yellowish in colour and intermittent to begin with and later become white. If the condition lasts dysentery and blood-stained mucous fæces may be evacuated. The patient strains and shows abdominal pain, the temperature may rise and eventually become subnormal, the coat is dry and staring, and the mouth is usually cold with saliva dribbling—eventually the eye becomes sunken and coma and death supervene. Any or all of these symptoms may be found.

Navel-ill.—Here, as a rule, we have the calf dull and lying down. The navel cord is usually thickened and inflamed. Pus can often be made to exude on pressure. The temperature is usually higher than in scour. Often symptoms of septicæmia are present. Death generally takes place quickly when the condition is acute. Other cases of a more chronic type are observed when abscess formation occurs at the navel. In navel-ill occasionally the symptoms are only noticeable after an autopsy has been made.

Joint-ill.—The symptoms here are swellings of the joints with a variable degree of septicæmia. The calf is usually dull and frequently lying down and often refusing its food. Lameness is a common symptom with swellings of the various joints, the hock and knee joints being the most commonly affected. These swellings are usually hot and painful and often shift from one joint to another. Lung conditions are commonly present and when such occur the patient often succumbs. Chronic cases may linger on for several months and may leave the patients with enlarged and more or less anchylosed joints.

Septic Pneumonia.—The onset of the disease here is very sudden and may or may not be associated with the already described conditions. There are high temperature, shivering and tremors, quick breathing, sore cough and nasal discharge, often of a rusty colour. Mortality is high.

POST-MORTEM EXAMINATIONS

From numerous examinations (macroscopical) of carcases the following lesions have been found:—peritonitis, enteritis, cystitis, hepatitis, and various stages of pneumonia. These lesions have been met with in all the above conditions at one time or other. In cases exhibiting typical symptoms of white scour, navel lesions with enteritis and peritonitis have been found and pneumonic conditions also have been present, whilst lung lesions have been observed also in navel-ill and

joint-ill. In calves showing navel-ill symptoms the cords have been found to be inflamed and containing pus within several hours after birth; also, cystitis and hepatitis are often found. In calves exhibiting joint-ill symptoms the joints have been found to be inflamed and often containing pus.

TREATMENT

As far as treatment is concerned, nothing so far has proved to be a specific. Certain drugs prove to be of value on certain farms whilst, on the other hand, on others the same drugs or same line of treatment for apparently the same condition prove quite useless. Any remedy, to be of any value, must be given in the early stage of the disease, for once the symptoms are firmly established nothing has proved to be successful. Preventative treatment would appear to give the best results, but in my opinion, once symptoms have developed the line of treatment really depends on the symptoms present. In cases of scour, drugs such as bismuth salicylate, opium, chalk, internal antiseptics, lemon juice, etc., have all been tried with variable success, whilst in cases showing symptoms of navel-ill and joint-ill treating the navel with iodine, formalin, etc., and also painting the swollen joints with iodine, combined often with various vaccines, prove again to be of limited success.

Sera and vaccines, both preventative and curative, for all the afore-mentioned conditions are on the market. Some encouraging results are obtained from their use on certain farms, whilst again on other places the results are disappointing.

Housing Conditions.

The conditions under which calves are reared would appear to have little or no effect on the mortality from these diseases. Treatment of navels, disinfection of premises, isolation, etc., etc., have proved repeatedly to be of little avail, although others claim such to lessen the incidence of the diseases. This may be so where one meets with a mild form of the diseases. It would appear that environmental predisposing factors play only a very small part, if any, in the occurrence of these diseases. It is of common occurrence to find calves kept under deplorable conditions to be free of disease, whilst others under ideal conditions have the diseases rampant amongst them. Investigation of these conditions is continually in progress.

Disease Immunity of Calves.

Outbreaks of disease amongst calves persist on some farms for a long number of years with maybe only a few deaths annually. On other farms these diseases are rampant for, say, three or four years, then they suddenly disappear and may not return for quite a long time. In self-contained herds this, in my experience, is often the case. Herds in which the cows are continually changing have the diseases more or less continually with them. Diseases like mastitis and abortion have been studied in connection with the above conditions, but it would appear that there is no correlation between them. Outbreaks of abortion and mastitis may or may not be present when the above conditions exist.

DISCUSSION

It would appear that there is a definite relationship between white scour, joint-ill and navel-ill. In my experience, a typical outbreak of one or other of the above conditions alone never occurs. One meets with symptoms of scour and navel-ill in the one subject, while again the conditions of navel-ill and joint-ill or scour and joint-ill may be noticeable in the same calf. These peculiarities have been of common occurrence during the present investigation. *Post-mortem* examinations have proved this more fully. Why should this be? Is it a case of a specific organism or virus at work with secondary invaders? The fact that such a variety of organisms have been isolated from different cases in different districts would suggest that all of these are secondary invaders. Only an organised programme of research can determine this point. Organisms such as *Bacillus ærogenes*, Paracolon bacilli, etc., have been demonstrated to be present (Hutyra and Marek, 1920).

Again, could the primary cause be a bacterial toxin produced in the stomach or bowel? So far, no attempts to determine this point have been made. It is quite possible for an anærobic organism to produce a toxin in the bowel of lambs which is responsible for death within 24 hours of birth or may cause an illness lasting for several weeks. (Gordon, W. S., on Lamb Dysentery).

Could not this state of affairs exist in calves? The organism responsible for the production of toxin might have a very low invasive power and never leave the bowel contents, which would account for the variety of secondary invaders which may be found in the above diseases. There is also the question of infection, whether it is pre-natal or post-natal. The disease of calves known as "white scour" has been attributed to intra-uterine infection, and its occurrence has been cited as an example of the hereditary nature of sterility. It is difficult to believe that such an infection would permit the calf to live until it was born and then promptly kill it, and further, it is not feasible that so virulent an organism as that responsible for white scour could maintain itself for any length of time in the uterus without setting up a definite metritis (Tutt). Again, since, as has been proved, the type of placentation in ruminants is very impermeable and the filterable properties of the

placenta are very efficient, one is led to believe that infection may be extra-uterine.

The same may be ultimately proved of the afore-mentioned conditions as has been proved of lamb dysentery. Here again it was thought that infection was *in utero,* firstly because deaths occurred very soon after birth and secondly because certain ewes had a bad reputation of losing their lambs whilst others never did so. This theory, however, has been completely negatived, as lamb dysentery has been proved by recent experiments to be due to extra-uterine infection.

The diseases under discussion have undoubtedly a definite seasonal occurrence. During spring months they are much more prevalent and when the cows are turned out to grass they gradually diminish and almost disappear, to return again in a mild form in the autumn. Is is possible that diets play an important part in the rôle of these diseases? As has already been stated, the incidence of calf diseases is greater during the spring months, this being the season when the cows are housed and fed on concentrates and when green food is lacking—and therefore the time when vitamins are most likely to be deficient. If an avitaminosis is likely to be associated with the incidence of calf diseases, it points towards an absence of vitamin A rather than of any of the other vitamins, since Green and Mellanby (1928), gave the name of "anti-infective vitamin" to vitamin A and pointed out that animals deprived of this substance died of bacterial infective lesions. It is claimed by Cramer and Kingsbury (1924), that a deficiency of vitamin A in the body simply brings about a breakdown of the local defences of such organs as the intestine, eyes, and lungs, against bacterial invasion, and has no effect on the general humoral defences. In any case, lack of vitamins could only act as a predisposing agent.

By way of experiment certain cows, during the later months of pregnancy, in several herds were fed in their daily ration with cod-liver oil to supply deficiency of vitamin A. I may say that in all of these instances the death-rate in the calves continued as it had previously done.

Feeding experiments have been also tried. McCandlish and Black (1932), undertook an experiment as the result of which they state that feeding pasteurised milk to calves makes them more susceptible to disease than when they are fed raw milk. The practice, however, of feeding pasteurised milk is unheard of in this district where nothing but pure raw milk is fed, and yet the disease is very prevalent. Milk is often diluted with water and fed as the daily ration. Little or no benefit is derived from allowing the calf to suckle its mother, or from its having the first milk, or from any special form of feeding, once the symptoms of disease are evident. According to Joest (1903), the great susceptibility of calves which have not as yet taken any food may be explained by the fact that the colon bacilli which enter the stomach before the ingestion of the colostral milk, pass without interference into the small intestines, as the stomach has not yet produced any gastric juice. Their penetration into mucous membrane is probably also facilitated by the fact that the intestinal epithelium does not at that period possess a mucous covering, and is therefore easily penetrated.

Recently I have fed several cows with formalin in their daily ration, milk of which cows has been used for the feeding of the young calves, and the results have been very encouraging. It has also been noted that the feeding of the young calves on milk from certain cows has proved to be of benefit. What virtue lies in the milk of one cow over that of another is lessening the incidence of the foregoing diseases? Is it the fact that certain cows may give antibodies in their milk to the newly-born calves and so set up a resistance in them?

At the moment I am using a convalescent serum. This serum has been prepared from calves showing very definite and severe attacks of white scour and which have recovered. This serum at present is being tried out on selected farms in doses of 10-20 c.cs. as a preventive. One half of the calves born are being inoculated and the other half left untreated. No statistics are yet available.

It has been my endeavour in the foregoing paragraphs to interest the Veterinary Profession in the study of calf diseases and if I have invoked a discussion from which new light may be forthcoming then I shall have achieved something.

Acknowledgments.

I wish to acknowledge the help received from Dr. L. Jordan, with whom I worked while collecting evidence for the questionnaires; also from Mr. W. S. Gordon, M.R.C.V.S., who, by kind permission of Dr. Greig of the A.D.R.A., was able to prepare the convalescent serum.

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The foregoing paper was the first to be discussed by Congress, Major A. Spreull (Dundee), presiding over the well-attended session of the Veterinary Medicine and Surgery Section at

which it was presented, at the Royal (Dick) Veterinary College on the morning of Monday, July 30th.

At the outset Major Spreull extended a warm welcome to the assembly, with particular reference to the presence of the representatives of the National Farmers' Union of Scotland, Mr. Robert Garvie, of Blairgowrie, and Major G. A. Wilson, of Keith, Banffshire. The Chairman then introduced the essayist, Mr. R. M. Smith, of Galston, Ayrshire, and Captain James Anderson, of Keith, who was to open the discussion.

Introduction

Mr. R. M. Smith said that, in introducing a paper on "White Scour and Allied Diseases in Calves," he should like to add a few further remarks. Since many bovine diseases had received and were receiving widespread consideration, he thought the time most opportune for a full discussion on the subject of calf diseases, as up to the present no organised research had been carried out. It was, therefore, for them to discuss the subject as fully as possible, in order to give the research worker every help and to stimulate an appreciation of the necessity for a whole-hearted investigation. As had been indicated in the paper, the losses from those diseases were enormous and surely rendered them worthy of investigation, from the economic aspect alone.

More rigid disinfection of markets and inspection of markets should be carried out.

He strongly recommended that the various public bodies interested should make an appeal to the Government, so that immediate assistance might be obtained for an organised programme of research. Preventative inoculation with convalescent serum would appear to be giving very encouraging results, but up to the present it had been practised on too limited a scale for statistics to be of any great value as yet.

In order to enable them to understand the paper more fully, he had brought with him a copy of the questionnaire used in collecting the statistics.

Mr. Smith concluded his introductory remarks by giving the headings of the questionnaire, these being as follows:—

Investigation into Mortality amongst Young Calves

1. Name.
2. No. calves born or purchased in (Slink calves sold excepted.) 1931 spring (Jan.-June) 1932 „ 1931 autumn (July-Dec.) 1932 „
3. No. calves died from any reason 1931 spring 1932 „ 1931 autumn 1932 „
4. No. calves died from white scour 1931 spring 1932 „ 1931 autumn 1932 „
5. No. calves died from navel-ill or joint-ill ... ... 1931 spring 1932 „ 1931 autumn 1932 „
6. State reasons for any other deaths occurring during these seasons, *e.g.*, hoose.
7. At what age were calves when affected with the individual conditions?
8. How long did affected calves live?
9. No. of calves affected with scour or navel-ill which recovered.
10. Line of treatment adopted and with what result:—
    Medicine } When given, how often and
    Vaccine } for how long.
11. Result of any *post-mortem* examinations.
12. General conditions under which calves are kept: cleanliness, temperature, in byre or isolated, etc.
13. Are navels treated at birth and, if so, with what?
14. (*a*) How many seasons has outbreak existed?
    (*b*) Have the seasons been consecutive?
    (*c*) How long since an outbreak occurred?
    (*d*) Disinfection of premises between seasons?
15. In cases where calves have been bought in, was the purchased animal affected,
    and, if so, was it affected at time of or after purchase,
    and was general infection prior to or after purchase of this animal?
16. Were there any cases of contagious abortion during the seasons mentioned?
17. Were there any cases of mastitis during the seasons mentioned?
18. Feeding:—
    (*a*) Was calf allowed to suckle at all?
    (*b*) Did it receive the first milk?
    (*c*) Was it fed from own mother's milk and, if so, in what quantity?
    How often?
    And for how long?
    (*d*) Was anything added to milk—*e.g.*, oatmeal?
    (*e*) Was milk raw or boiled?
19. Condition of dam at time of calving: *e.g.*, mastitis, hanging cleansing, etc.
20. Ultimate condition of animals which survive.
21. Any other remarks.

Conclusions.

[This questionnaire covers the work of two years only: the investigation was continued up to the Spring of 1934.]

Discussion

Captain James Anderson (Keith), who opened the discussion, said:

Mr. Smith, in presenting his paper on "White Scour and Allied Diseases in Calves," has referred to the very serious losses which are being experienced in self-contained and other herds in Ayrshire. Unfortunately, their ravages are not limited to one county or part of the country. Within recent years the mortality among calves, all over the country, has been increasing to such an extent that various agricultural bodies have been discussing the problem and are agitating for further investigation and research with a view to controlling the spread and lessening the high death rate resulting from these diseases among calves.

A vast amount of work has been carried out in different parts of the world in connection with these diseases, but so far the results of these investigations have not led to any practical means of controlling them.

Mr. Smith discusses and describes these diseases as he finds them affecting herds in Ayrshire, and from a questionnaire distributed among the farms we learn that there is a high mortality with seasonal variation. I think we can take it that this is the general experience. The death percentages classified under "Other Diseases" are somewhat misleading. It may be that many of these calves were the victims of the infection accounting for deaths classified as white scour, navel-ill, or joint-ill. More valuable data would have been gleaned by "checking up" the diagnosis of the farmers, and I think it would have been helpful if he could have given an idea of the prevalence or absence of contagious abortion on the various farms, whether sterility was recognised, and whether or not there were many cases of "retained placenta" among the cows. He states that there would appear to be no correlation between abortion and these diseases. I am strongly inclined to the other point of view, and think that the inroads made by abortion are responsible for many outbreaks of white scour among calves, which, had they been born of healthy stock, would not have been such easy prey for the organisms responsible. This does not mean that abortion must be present on the farm. I have known of a farm on which two bulls were kept; where the calves by one bull were healthy and vigorous and gave little or no trouble to rear, but the calves by the other bull were delicate from birth, readily contracted scour, and were difficult to rear. This particular bull came, as a yearling, from a farm badly infected with abortion. Does not this suggest the possibility of a sire from an abortion-infected herd producing calves with a low resistance to bowel infections?

A record of the state of health of the calves at the time of birth would have been very interesting and helpful, and I think a necessary inquiry in any such questionnaire.

In an oubreak one usually finds that the first evidence of disease is white scour, navel- and joint-ill manifesting themselves later. There is no clear line of demarcation between these diseases. White scour, calf septicæmia, and pneumonia are all linked up, the one with the other, and are further complicated by other arthritic and pyæmic disturbances. I do not consider white scour a specific infection due to any one particular organism. Investigations have shown that several organisms may be associated with the scour—the particular part played by any one is unknown. In 1901 Professor Nocard investigated a very extensive outbreak in Munster, and attributed the cause of the outbreak to a Pasteurella—later Jensen and others held a colon bacillus as the responsible organism. Meissner and Wetzel, in their work on "Infections of New Born Calves," describe (1) *Bact. coli* Infection, (2) Paratyphoid infections caused by *Bact. enteritidis Gärtner* or, more rarely, by *Bact. enteritidis breslaviense*, (3) Diplococcus infections, (4) Pasteurellosis caused by *Bact. bipolare Vitulisepticum*, (5) *Bact. pyogenes infections*, (6) *Bact. Necroseos Bang* infection (*Actinomyces necrophorus*).

1. *Bact. Coli Infection.*—This is the common white scour of calves. In Germany this comprises about 45 per cent. of all calf infections; the predisposing cause is the lowering of resistance from whatever origin. Infection is considered to be picked up usually *per os*, though it may penetrate the navel cord. Characteristic autopsies show enteritis and septicæmia—arthritis usually occurs in the more chronic cases. Control can be effected by attention to hygiene and the isolation of affected animals.

2. *Paratyphoid.*—In Germany, *Bact. enteritidis Gärtner* infection comprises about 13 per cent. of all calf diseases. The disease occurs in similar circumstances to white scour. Infection is usually *per os*. The incubation period is about two days, and the disease is a septicæmia. Calves, eight days or over—even up to six months—may be attacked. Calves so attacked have slight diarrhœa, may cough, may show thickened joints, and there is high fever. Autopsy shows a picture of septicæmia. Control is chiefly by hygienic measures.

3. *Diplococcus Infections.*—Comprise about seven per cent. of calf diseases in Germany. The causal organism is said to be *Diplococcus lanceolatus Fränkel*. Infection is *per os* and the disease is a septicæmia. Calves are stricken between the second and fourth week of life. Thickening of the spleen is a constant finding on *post-mortem*. Control is by attention to hygiene and active immunisation is said to be valuable.

4. *Pasteurellosis.*—Comprises five to eight per cent. of calf infections. Infection is usually *per os*, but may be by navel cord. This disease runs a rapid course ending in death in one to two days. Pneumonia accompanies signs of general septicæmia.

5. *Bact. pyogenes Infections.*—Comprise about five per cent. of calf diseases. Infection is *per os* and perhaps by the umbilicus. The disease runs a more chronic course. There is a dry cough and anorexia. There may be arthritis.

6. *Calf Diphtheria.*—Comprises about three per cent. of calf diseases. Infection is *per os*. Affected calves show necrosis of the mouth and the condition may spread along the digestive and respiratory tracts. Death often occurs in four to six days, though the calf may survive for two or three weeks, and may recover.

From the foregoing we see there are a number of organisms associated with white scour and its allied diseases, and the colon bacilli seem

to be accountable for the largest proportion of outbreaks.

Williams, and his colleague Carpenter, question this and state that a streptococcus of the viridans group is the most prominent organism present. Carpenter failed to identify the colon organism in the intestinal tract of fœtuses and of sick calves destroyed before death was imminent, but has frequently recovered in these cases the streptococcus of the viridans group. Later when the calf was apparently dying or has been dead for a few hours prior to making of cultures the colon organism becomes very conspicuous. He has been unable to cause diarrhœa with this organism although other workers claim to have done so. I am of the opinion that these infections should be regarded as secondary and that the important cause is non-specific and related to bad hygiene in a wide sense. The essayist puts forward the suggestion that the condition might be accounted for by the presence of a bacterial toxin in the stomach or bowel producing its results in a manner similar to what occurs in lamb dysentery. This is a new view point which seems worthy of further investigation, and is in accord with present-day fashion.

From whatever cause, there appear to be two forms of white scour, (*a*) the virulent acute form as described by Mr. Smith, and (*b*) what I call the "dietetic form."

It seems extraordinary to me that this virulent form of white scour should be so prevalent in self-contained herds in Ayrshire. I have always been under the impression that the establishing of self-contained herds meant the eliminating of disease. Apparently this is not so in Mr. Smith's experience, and it would be of interest if he could give some explanation for its virulence in these herds. While we have not many such herds in the north-east, I cannot recall an outbreak of virulent white scour in any of them. On the contrary, the general health of the stock is of a higher standard. Where we do get this form of white scour is on farms where it is the custom to buy in calves to "double suck" cows, and here the disease is a real menace and a source of great loss, and when once established is very difficult to eradicate. At one time it was possible to get a supply of calves from crofters in the surrounding districts, and for these calves direct from the croft the farmer was prepared to give an extra price because of the assurance he had of not bringing infection on to his farm. With the disappearance of the crofts this calf trade is now in the hands of dealers, and the calves are cadged about all over the country to the various auction marts—they are irregularly fed, exposed to cold and all sorts of infection. These are the calves that are responsible for our outbreaks of virulent white scour, and will be responsible for it until such time as some system of control is established whereby it will not be possible for calves affected with scour to be exposed for sale.

Dietetic Form.—It is often very difficult or impossible to differentiate between diarrhœa in young calves caused by improper feeding and diarrhœa that is purely infectious. In this type the cause is usually attributable to some sudden change in the system of feeding among the cows whereby the normal milk content is altered, setting up digestive disturbances in the calves. Exposure to cold is a predisposing factor in this variety. The presence of lice in the herd is another factor which is detrimental to the well-being of young calves. In some cases there may be no general upset in the feeding system. It is sufficient for one cow to be the source of the trouble. Her milk may be of such a nature as to cause diarrhœa in her calf, but from whatever source the original diarrhœa starts it very soon takes on an infectious nature and spreads through the byre, affecting calves of all ages, and in this form the older ones seem to suffer most. Calves born during an outbreak usually contract the disease within two or three days and calves brought on to the farm show evidence of scour in three to five days. While the infection spreads quickly, this type of the disease usually responds to treatment, and although the calves are left emaciated they pick up readily. I have observed that these recovered calves do not readily transmit the disease when introduced among fresh calves—in this way differing from calves which have lived through the virulent type and which appear to act as carriers for an indefinite period.

In discussing pre-natal and post-natal infection Mr. Smith, while supporting the latter assumption—and I think rightly so—at the same time states that in calves showing navel-ill symptoms the cords have been found inflamed and containing pus within several hours after birth. In the face of such a statement I think one must conclude the presence of a pre-natal infection. Where there is a history of abortion or sterility in a herd it is not an uncommon occurrence for calves to be born weakly or showing decided evidence of illness, and in these calves an inflamed condition of the umbilicus is often present, but I have never seen pus within 48 hours. Would not this point to an intra-uterine infection? The mortality in calves in such herds is very high.

I consider it not unlikely that calves are born with a certain bacterial bowel content which, under normal circumstances, does no harm but may, under suitable circumstances, flare up and account for an infectious outbreak such as I described in the dietetic type. In this connection one must not forget the fact that the cow has become a highly specialised milk producing machine, and her progeny may thus have a lowered resistance to infections, and it is quite possible that her milk may be less suited for the early days of young life. In herds where the

resistance of the young is lowered from the presence of contagious abortion or its associates, the disease assumes a virulent form.

In discussing the treatment and control of these conditions, the essayist is not very optimistic. We know from experience that no drugs have any specific effect on virulent white scour. A line of treatment successful in one outbreak may prove quite useless in the next, *e.g.*, the administration of alkalies combined with sedatives may prove helpful, and in another outbreak be of little value—whereas a change over from alkaline treatment to mineral acids often gives beneficial results. This feature may at times be observed among the calves in the same byre suffering from the disease—some responding to alkaline and others to acid treatment. A variety of sera and vaccines are available for treatment, but I cannot say I have seen much benefit from their use, either as preventative or curative agents. This is not to be wondered at when one considers the variety in the strains of infection that may occur. As already stated, Meissner and Wetzel considered active immunisation valuable in Diplococcus infections. Meissner and Koser found vaccination useful in calf diphtheria. Mr. Smith is at present experimenting with a convalescent serum, and it will be interesting to learn the result. So far as one can gather, the reports on immunisation therapy are so variable that it is doubtful if one can place much reliance on its use.

In attempting to control an outbreak of white scour, whether of the virulent or dietetic type, I consider it highly important to insist on rigid cleanliness in the handling and housing of calves. Unlike the essayist, I think good nursing in hygienic surroundings goes a long way towards promoting recovery. Calves, wherever they are kept, should have fresh air and sunlight, and clean, dry bedding; they should be kept at an equable temperature, and not exposed to draughts. The attendants should observe strict cleanliness and be made to realise that they are important factors in the spread of the disease. While I consider that infection is *via* the alimentary tract, I think it highly desirable that the navel cord be soaked in a disinfectant two or three times daily till it is shrivelled up.

If we assume that the calf is born with a certain bacterial bowel content, we ought to do our utmost to prevent this becoming an infection. Milk should be withheld from new-born calves until the bowel has been emptied. This may be assisted by enemas, and I prefer this to dosing with oil or other purgatives. A well-nourished calf will take no harm from being without milk for the first 24 hours of its life, neither does it harm the cow not to milk her. After the bowel has been emptied the calf should get the colostral milk, which is of special value, not so much from any laxative effect it may have, but from the fact that it contains protective antibodies which enable the calf to control the effects of colon and other bacilli that may be present. The quantity of milk must be restricted for the first ten days. In spite of a moderate bacterial bowel content, a small amount of milk will be digested without disturbance, but when the quantity of milk is in excess the digestive process is held up and the bacteria gain the upper hand.

In the first fortnight or so of a calf's life a careful watch should be kept on its condition. It should not be allowed to become gaunt or pot-bellied. The nature of the fæces should be carefully checked and on the first signs of fæces adhering to the tail and buttocks special attention should be given that calf. A too liberal supply of milk may be the cause, or it may be that the milk of a particular cow has become altered in some way. It is always advisable to enquire into its nature and quality, and, if need be, take steps to correct it. We know that some cows have hard-curding milk, while others have soft-curding. The hard-curding milk with its excess of casein coagulates in the stomach into large dense curds, which are not easily penetrated and digested by the peptic juices, while the soft-curding milk forms loose curds easily permeable by the gastric fluids, and, therefore, much more readily digested.

The calf should be given a dose of castor oil, and milk withheld for 24 hours, and in its stead a pint of warm water with a little bicarbonate of soda should be given three times in the 24 hours. After the bowel has been emptied the calf should be put back on its milk ration gradually.

I have tried briefly to indicate the steps I consider necessary to take in controlling an outbreak of white scour, but these remarks do not help us so much to control the outbreaks of scour which originate in byres from calves that have been bought in—these are the animals over which it is necessary to have some control.

The control of animal diseases in Great Britain follows certain well-recognised lines, and I propose to review them briefly, in order that the representatives of the National Farmers' Union of Scotland, whom we are glad to have with us—(Hear, hear)—may appreciate the situation from the veterinary point of view. The first stage is the immediate notification to the local constable of the suspected existence of disease; he, in turn, serves a notice ordering the isolation of the animal, and either the total prohibition or restriction of movement. The next step is the establishment of a diagnosis by the veterinary inspector. If a negative diagnosis is arrived at it is followed by the withdrawal of restrictions. If positive, depending on the character of the disease, either appropriate treatment or slaughter is carried out. Keeping these general principles in mind, let us consider how they would apply to white scour in calves. Notification, isolation, and restriction of movement are possible. The

diagnosis of white scour presents certain difficulties in the early stages. We have no reliable test analagous to the tuberculin test in tuberculosis, the mallein test in glanders, or the blood agglutination test for contagious abortion, and herein lies one of the biggest stumbling blocks to effective control. Assuming that the disease were made notifiable, and diagnosis depended on the manifestation of clinical evidence, the only step that could follow would be prohibition of movement of calves off infected premises, unless to a slaughterhouse. The question of the determination of the period of prohibition of movement raises even greater difficulties.

In view of the widespread prevalence of this disease, and the dislocation to the cattle industry which would follow, I question if the agricultural community would tolerate such control.

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Professor D. C. Matheson (Edinburgh), on rising to express appreciation of Mr. Smith's paper, said there were one or two questions he should like to ask. White scour was recognised "by the characteristic chalky, putty-like condition of the fæces"—he would like to know if there were some way of recognising the disease other than by means of that somewhat striking clinical symptom.

In connection with navel-ill, the essayist said: "The temperature is usually higher than in scour." Was that because the diarrhœa tended to reduce the body-heat?

In regard to joint-ill, one read: "The symptoms here are swellings of the joints with a variable degree of septicæmia." What procedure was adopted to establish a diagnosis of septicæmia? Again, what precisely was meant by the term "septic pneumonia"? Was a bacteriological examination made?

Turning, in the next place, to the *post-mortem* examination, the essayist said: "From numerous examinations (macroscopical) of carcases, the following lesions have been found: peritonitis, enteritis, cystitis, hepatitis, and various stages of pneumonia"—quite a formidable array of lesions. The speaker desired to ask if the essayist had found any correlation between the lesions and any one form of disease, *e.g.*, was enteritis typical of white scour, peritonitis of navel-ill, etc.?

In connection with treatment, he would like to ask Mr. Smith if an autogenous vaccine had been prepared from any of the cases, or if any attempt had been made to produce an immune serum against organisms isolated from these particular cases.

In conclusion, he would say that in any system of control, and especially if notification be considered, the first requirement was the possession of some accurate method of diagnosis, and a perusal of the paper suggested that the differentiation of white scour from the allied conditions was not easy at the present time.

Dr. L. Jordan (W. Sussex) observed that he felt that, although he could add but little to the discussion, he must give Mr. Smith at least a little support, because the latter and he started that investigation together. Mr. Smith's paper was not (if he would allow him to say so) and was not intended to be, highly scientific. Their idea was "here are these tremendous losses from white scour and nobody seems to be doing anything about it"—and the fact that there had been a paper on the subject read at the "National" Congress did at least show that the Veterinary Profession was taking an interest in the disease and allied conditions and were at last aware of the gravity of the losses they occasioned.

Early in the year he had published a paper in *The Veterinary Journal* dealing with part of that work, but whereas he had dealt with only 26 farms, Mr. Smith had dealt with 52. He (the speaker) showed that 90 per cent. of the farms they investigated were sustaining those losses, and he saw that the percentage remained the same in Mr. Smith's series, as did the percentage coming under the various headings. They were able to show that in Ayrshire alone the losses from calf scour were over £20,000 per annum.

He supported all that Mr. Smith had had to say concerning symptoms and treatment.

Unfortunately, he had to differ from Captain Anderson on the question of hygiene. They thought it was obvious that calves kept under good conditions would be healthier than those on bad farms, but they found that, in point of fact, that was not so. That seasonal wave was a very significant thing: it seemed always to be the case that the day the cows went out to grass newly-born calves ceased to be affected with white scour.

The question of avitaminosis was for a long time "a bee in his bonnet," but the results of feeding cows and calves cod-liver oil were not very encouraging. They also thought they got good results from feeding "long" doses of potassium iodide, but their findings were inconclusive as yet, and he would like to know if the essayist had carried that aspect of the matter any further.

Captain Anderson had mentioned the question of the correlation between abortion and white scour: they were able to find none. There was also the question of self-contained herds. Most of the herds in Ayrshire were self-contained, but they could deduce nothing from the relative incidence of white scour in herds which were self-contained and those which were not.

Mr. Smith had mentioned the use of sera: no matter what methods of immunisation were tried, it was the use of sera which, in the end, represented their ultimate efforts in this field of prevention and treatment. He was very anxious to know, therefore, what results Mr. Smith had from the use of sera, because it might mean that the problem must be attacked by that method.

Mr. P. Meikle (Strathaven) congratulated Mr. Smith on his efforts to investigate those terrible diseases amongst calves: he sincerely hoped that he would meet with success in his investigations, and he desired to add, also, that he would be very pleased to give him any assistance that lay in his power.

Mr. Smith had not said very much about septic pneumonia: he himself always termed it infectious pneumonia. It did not seem to affect the younger calves so much as those from two to

three months old, and heifers up to 18 months. Infectious pneumonia was the only one of this group of diseases which he had been successful in treating with a vaccine and a serum—if one used them both together one would get wonderful results. He did not know whether or not Mr. Smith had had a similar experience, but it appeared to him that the disease was very infectious, and was often mistaken for hoose, the difference being that in infectious pneumonia there was a very dry cough, while it usually originated from premises that were insanitary—dark, damp, and badly ventilated. He thought that the disease was mainly seen in calves that were born with a very low resistance, therefore they should confine their efforts to an endeavour to get some form of prevention rather than cure, as the results of treatment with sera were erratic.

It seemed to him, from his own experience, that the disease was due to the cow receiving an improperly balanced diet during the winter, because it usually started from February to May, and when the cow was put to grass the disease suddenly disappeared. That would indicate that it was due to some deficiency in the cow or in the milk of the cow, which gave rise to lowered powers of resistance to bacterial infection in the calf.

He was quite certain that the disease did not develop in the womb, but that it had its origin in the cow's milk being deficient either in vitamins or in mineral elements: when spring came she seemed to be exhausted of those elements: therefore the calf suffered.

He quite agreed with Mr. Smith that the milk of some cows was more beneficial to calves than that of other cows: proving that there must be some deficiency in the milk of the latter.

Calf disease was very prevalent on any farm where one got a good deal of "hanging of the cleansing." That, he thought, was an indication that the cows had been fed on a badly balanced ration during the winter: there was something deficient in it.

He would like to thank Mr. Smith for his paper and also Captain Anderson for his spirited contribution.

Mr. A. Spicer (Oxted) said that all the speakers so far had come from the north and he thought that perhaps one from the south should participate in the discussion. (Hear, hear.)

In his district they met with a great deal of white scour, but very few outbreaks of pneumonia or septic infection, while thus far he had only met with one case of joint-ill in calves. That seemed to him to show that the diseases were not allied in any way.

He did not think that feeding had any particular effect on those diseases, because he had known animals fed heavily on minerals and green food—kale particularly—right up to January and February, and the infection had remained as severe as ever.

If there were any association between these conditions, the septic forms should be just as prevalent in his district as was white scour, and they would also see a large number of cases of joint-ill and navel-ill.

Some time ago he pointed out that a cessation of these affections followed the slaughter of all the rats on the farms concerned: that might be coincidence, but he did not think so, for they must always bear in mind that rats were great carriers of infection. He hoped that Mr. Smith would be able to give them information as to whether or not there was rat infestation on the farms concerned in his investigation—whether he had been looking into that question, which he (the speaker) considered to be of some importance.

Mr. Robert Garvie (Blairgowrie) observed that, in the first place, he would like to thank that Congress for giving the Farmers' Union of Scotland the opportunity of being present at that meeting and hearing that discussion on white scour in calves.

That question was raised at one of their meetings by the representative of one of the north-east branches, who was present that day. (Hear, hear.) They knew that there were tremendous losses in connection with white scour in calves, and he had listened with great interest to the discussion that had taken place that morning.

The aspect of the matter that particularly interested them was, of course, the circumstance that they always seemed to get a considerable amount of the infection from calves that were exposed for sale at auction marts. That point was stressed by the speakers at the Union meeting, and it was then thought that some effort might be made to secure the enactment of veterinary control measures in connection with the exposure for sale of calves. They realised that that would have to be done through the Ministry, and they thought that if the Farmers' Union and the Veterinary Profession made joint representations on the matter they might be able to get the Ministry to take some steps to ensure the more effective supervision of the handling of calves.

In one area there was a large number of calves brought from England, and they did not know how long the calf had been on the journey, when it was last fed, or on what it was fed. Yet it was a curious fact that few or no calves showed evidence of illness at the marts: whether or not the dealers knew of some means of keeping them to all appearances free from illness until they arrived at the premises of the farmer, he did not know—(laughter)—but it was not long before the trouble manifested itself.

It was strange that in Ayrshire they had so many self-contained herds affected: that was not the case in the north, and the disease was brought in there with the calves purchased, mostly at auction marts.

The Farmers' Union were very pleased that the Veterinary Profession were making more effort to get at the root of this trouble—to find a cure or, better still, a preventative—and he dared say that if lack of funds was any obstacle, their society, though it could not vote from its own funds for such an end, would be very pleased to co-operate with the profession in any effort put forward either to secure a grant or otherwise for the purpose of promoting such a vitally important investigation. (Applause.)

Major G. A. Wilson (Keith) said that, as one who was responsible for bringing that question forward at the meeting of the northern executive of the National Farmers' Union of Scotland at Elgin nearly a year ago, he thought that after that day's discussion they would consider that he was amply justified in doing so. (Hear, hear.) He could assure them that in the north-eastern districts of Scotland that scourge was very prevalent, and caused enormous losses.

He would like to refer to the seasonal nature of the outbreaks of the disease. In the autumn the disease was not of the same virulent type, and he entirely agreed with Captain Anderson, who was his veterinary adviser, that the type he styled dietetic was perfectly easily cured up to a point. The trouble was caused by the disease that was brought in by the calves they got from the dealer. He did not think for a moment that

the feeding of the cows had anything to do with the matter—excepting the dietetic type of the disease—because Mr. Smith's statistics showed that in Ayrshire the percentage total average annual death-rate from all causes was 20 per cent.; in the autumn the death-rate from white scour was down to 12 per cent., and in the spring it rose to 60 per cent. Did not they think that there was a close connection between that rise in the percentage and the method in which the calves were transported? In the winter the calves were taken, in open trucks or floats, a matter often of 120 miles. In inclement weather they contracted chill and they might not be fed for two or three days; when they got to their destination they received a mixture of anything—everything except milk. The dealer was entirely responsible for that state of affairs. The farmer would like the Veterinary Profession to give a lead in the method of transport and in the feeding of those calves while they were in the hands of the dealers.

The Government were going to assist in the production of beef, but if they did not have the young calves they could not have the stores, and if they had not the stores they could not have the finished article the Government were going to give them a levy to produce. He thought, therefore, that if the Government could by legislation enforce on the dealer stricter measures of transport and feeding, and of cleanliness in the pens, the losses from this disease of calves would be effectively diminished.

He agreed with Captain Anderson that that could not be made a notifiable disease, because the disorganisation for the breeder, and the expense, would be enormous, but he did not think that it was beyond the bounds of possibility for the Ministry of Agriculture to introduce strict control over the dealers, who were handling some thousands of calves before these were handed over to the farmer, and he was satisfied that, with the co-operation of the Veterinary Profession, in a few years that costly scourge would be enormously reduced in severity.

He desired, as a humble member of the farming community, to congratulate Mr. Smith and Captain Anderson on their contributions on that subject.

Mr. Hugh Begg (Lanarkshire) said that, as a whole-time veterinary officer, there were just one or two points he wished to make, and particularly did he derive inspiration from Major Wilson's remarks regarding any effort the Veterinary Profession might put forth to make an end of the existence of white scour in calves.

He was constantly in attendance at auction marts, and saw hundreds of calves every week being very badly treated. He thought it a shame that, for example, calves with a raw umbilicus should be kept tied up in bags for long periods and left lying about stations, etc. In his view, it should be made compulsory that no calf should be allowed to be taken from the place in which it was born until it had been well fed and was 14 days old at least. He did think that, as humane individuals entrusted with the care, health, and lives of stock, they should take strong action to stop that cruelty in the handling and bad treatment that calves received. Moreover, in his opinion it was due to that treatment that the navel became infected.

He was not of the opinion that the dealers, of whom one speaker had stated that they were able to protect calves until sold, had any method of treatment that would, as it were, "hold up" the disease in the calf until the animal had left their hands. It might be that the disease was incubating while they were in the dealers' possession and that it revealed itself later on the farm.

In his view, there was a relation between this group of diseases in calves and joint-ill in foals. Forty-seven years ago, when he was examined as a student for his diploma, he was taken on omphalo-phlebitis. They would see that even in those early days the infection of the umbilical cord was a serious trouble.

He thought, therefore, that if they were to eliminate all that bad treatment of calves, allowing them to establish their grip on life by remaining on the premises on which they were born until they were strong, they would also eliminate a great deal of calf disease.

He regarded Mr. Smith as being very gallant in bringing forward for discussion a group of diseases of that kind, in the elucidation of which we had made no advance at all—not one iota of progress had been made for 50 years—and the essayist had performed good service in making it plain to the powers that be how much money was being lost to agriculture to-day through those diseases.

Mr. N. S. Barron (Reading) observed that from Mr. Smith's paper it seemed quite clear that white scour was common to many conditions and that in itself it was only a symptom. They might say to him that by postulating another possible cause he was merely adding to the complications attendant upon the condition, but in a recent issue of *The Journal of Infectious Diseases* he came across an article on diarrhœa in human infants caused by the *Clostridium welchii*. This disease was cured by the administration of sour milk, and it had occurred to him that this organism might be one of the possible causes of white scour in calves: the variations in the results of the treatment of that condition, and the fact that the disease broke out under all sorts of conditions, added to the possibility of *welchii* being a cause.

He would like to ask Mr. Smith if he had any evidence that one of that group of organisms could be at the root of some type of white scour. Unfortunately, he had no means of testing out any serum, but it seemed a possible line of treatment.

Dr. R. F. Montgomerie (Bangor) said that there was one point mentioned by Mr. Meikle which he would like to stress. Mr. Meikle had rather objected to the term "septic pneumonia" and suggested "infectious pneumonia," and he (Dr. Montgomerie) agreed with him, because amongst the group of diseases under discussion there was one that stood out from the others and that was infectious pneumonia. They saw a lot of it in North Wales, especially in young cattle imported from Ireland, from which the infection spread through the calves on the farms. For that reason he was of opinion that the term "infectious pneumonia" was to be preferred.

They had tried, to a certain extent, to investigate the disease, and he could say at the moment that they had met with a certain measure of success in the use of a serum.

The main reason why he was speaking that day was to follow up the question introduced in his paper by Mr. Smith and a minute ago by Mr. Barron, of the disease being an enterotoxæmia due to a member of the *B. welchii* group of bacteria. He had to acknowledge to Colonel Bowes the information that the use of lamb dysentery serum could give excellent results in the treatment of white scour in calves. That suggested looking into the bacteriology of the intestinal contents of affected calves.

Proceeding, Dr. Montgomerie stated that, as a result of their investigations at Bangor, they had collected a good deal of evidence that supported

the suggestion that in some of those cases of white scour there was an organism of the *welchii* group at work. It seemed to him that many cases arose from some factor which allowed *Bacillus coli* to get to work in the intestines, and that that, again, prepared the way for some organism of the *welchii* group.

He desired to raise a third point, and it was this: he did hope, when he saw the title of the paper, that there might be discussed those very sudden deaths which occurred among young calves. He lived in a district where there had been no great demand for milk (prior to the operations of the Milk Marketing Board) until the month of August. The result was that for a short period there was a much greater supply of milk for the calves than normally, the calves thrived particularly well, and under these conditions they met with a number of sudden deaths amongst the calves. After a very short period of illness, the exhibition of acute "nervous" symptoms led to death before veterinary assistance reached the farm. Here again, he had a good deal of evidence that this was an acute entero-toxæmia due to an organism of the *welchii* group. He desired to ask Mr. Smith if, during his wide investigation, he had met with any definite condition such as the one he had mentioned.

Dr. W. S. Gordon (Moredun Institute) said that Mr. Smith was to be congratulated on his courage in bringing forward for discussion the subject of white scour and allied diseases in calves. The title of the paper was a comprehensive one and might have been dealt with in one of two ways: either by writing a comprehensive paper embracing all the diseases from which calves may die, or by treating the subject in a general way. Mr. Smith had chosen the latter method, and he congratulated him on his selection, particularly since our knowledge of the true nature of the diseases of calfhood was in such a rudimentary condition.

White scour in calves was a disease which had long been recognised by veterinary surgeons, and numerous attempts had been made to determine its nature. At the present time no definite evidence existed regarding the etiology of white scour, and until it formed the subject of organised research the position would probably remain unaltered. Many theories might be put forward regarding the cause of white scour in calves and whilst those might be helpful in suggesting the lines along which investigation might proceed, they must necessarily remain theories until they could be subjected to experimental trial. The great value of Mr. Smith's paper, however, was the statistical evidence which it afforded regarding the enormous losses which occurred in calves from white scour and allied diseases. Mr. Smith had stated that 50 farmers in Ayrshire tabulated their experiences, showing that 90 per cent. suffered losses in calves as follows:—

Total average annual death-rate from all causes, 20 per cent., consisting of:—
White scour, 40 per cent.
Navel-ill or joint-ill, 50 per cent.
Other diseases, 10 per cent.

From reports received from different parts of the country there was evidence to suggest that similar losses were being experienced in many of the districts where calf rearing was being carried out, and the total loss to the country from those diseases must be enormous. It was to be hoped that in the not-too-distant future the Veterinary Profession would be afforded the opportunity and facilities necessary to investigate the diseases of calfhood in an organised fashion and in the first instance attention might be directed to white scour, which appeared to be a specific disease characterised by disorder of the digestive tract. In all probability the problem was not one which would be readily solved, but the annual losses from white scour in calves indicated that the organised investigation of that disease was an urgent necessity, and perhaps the information which Mr. Smith had put before them would set the wheels in motion.

The Reply

Mr. R. M. Smith (Galston), in replying, expressed his indebtedness to those who had taken part in the discussion and for the very kindly way in which they had done so. It was some satisfaction to him to know that a well-sustained debate had been promoted and that the majority of speakers appeared to agree, in part at any rate, with the views he had put forward in his paper. He desired, in particular, to thank Captain Anderson for his opening of the discussion and for the manner in which he had lightly let him off. (Laughter.)

In regard to abortion and mastitis, these conditions might or might not be evidenced clinically during an outbreak. In the area of his investigation, in those districts in which milking cows were kept the incidence of calf scour was certainly greater, however.

Captain Anderson had also agreed that notification of the disease and an organised programme of research were necessary.

Professor Matheson made reference to the diagnosis of the various conditions. In his (Mr. Smith's) opinion, all that they could say about that was that they had to take the history into account, and certainly in white scour diagnosis was arrived at by that means, for the condition was rarely or never found alone.

The temperature in white scour was lower than in navel-ill or joint-ill. Septic pneumonia was usually a lingering condition and did not, as a rule, respond to treatment.

The *post-mortem* lesions mentioned might be found in all the conditions dealt with, or they might vary in different cases.

Concerning autogenous vaccines, none had been used in the outbreaks under investigation, and, in further reference to notification, he would add that all infected farms, or those on which the disease white scour was suspected to exist, would have to be notified.

Dr. Jordan had made reference to hygienic conditions. He thought he might say that in Ayrshire they had conditions approaching the ideal in that respect, and yet in some such places the condition of white scour had been very prevalent. He strongly agreed with Dr. Jordan's observations in that regard.

Concerning treatment, several stocks had been treated with potassium iodide, formalin and cod-liver oil, but with doubtfully beneficial results. In outbreaks of scour in foals they had had good results from treating the mare with potassium iodide, but similar treatment of the cow had not yielded those results in calves.

Answering Mr. Meikle, he was sorry to say that septic or infectious pneumonia had responded to no treatment at his hands. The use of cod-liver oil might be of some value, but he had had no useful results with stock vaccine treatment—he had not tried an autogenous vaccine. His own treatment was the use of cod-liver oil and the provision of open conditions—the calves only to be housed in wet weather.

Mention had been made of the possible influence of deficiency either of vitamins or of the

mineral elements present in green food. They were, in his opinion, to be regarded as predisposing factors, but as nothing more than that.

The condition of white scour mentioned by Mr. Spicer as being met with in the south was apparently a different condition from that with which they had to contend in the north, in that symptoms of joint-ill did not appear to be present. In Ayrshire he seldom saw a case of white scour alone. The carrying of infection by rats seemed to be out of the question with them, as in Ayrshire the premises were very excellent and were not rat infested.

In reply to Mr. Barron, he understood that sour milk or a substitute was freely used at Auchincruive, Ayrshire, but with very little effect, except in cases where the trouble was obviously dietetic in origin.

Concerning Dr. Montgomerie's preference for the term "infectious pneumonia" over "septic pneumonia," the latter, in reference to the condition allied to white scour, was certainly a loose term, but what was referred to in that paper was that condition which followed immediately after birth and not that which was found several months later.

He, too, had had experience of the condition in which a calf, apparently all right in the morning, was found dead at night without showing any symptoms of illness.

Resolution

Following the according of a hearty vote of thanks to the essayist, the opener of the discussion and others who had participated therein, the Section unanimously passed the following resolution for submission to the Adjourned Annual General Meeting (closing meeting of Congress): "That a small committee be formed to consider the possibility of the National Veterinary Medical Association taking steps, in conjunction with the National Farmers' Union of Scotland, to formulate an organised programme of research into white scour and allied diseases of calves."

No. 2.—ENTERO-TOXÆMIA IN HERBIVOROUS ANIMALS—ITS POSSIBLE BEARING ON GRASS SICKNESS IN HORSES*

W. S. GORDON, PH.D., M.R.C.V.S.

Animal Diseases Research Association, Moredun Institute, Gilmerton, Edinburgh

Veterinary practitioners are familiar with a group of diseases which make their appearance in herbivorous animals, generally at the commencement of the recognised grazing season. For example, there are the so-called "stomach staggers" in cattle, forms of grass-ill in lambs, grass tetany in cattle, "pulpy kidney disease" in lambs, toxæmia in pregnant ewes, grass sickness in horses, the so-called "clover poisoning," etc. The etiology of most of these diseases is still obscure, but they have certain features in common in that they are generally characterised by symptoms suggestive of a toxæmia, quickly followed by death, by the rapid decomposition of the carcase and by the excellent physical condition of the animals at the time of attack. *Post-mortem* examinations made immediately after death disclose on superficial examination little gross pathological change. Related to the above diseases in the clinical feature of rapid course and usually fatal outcome are "infectious entero-toxæmia" and braxy. The last is distinguished by the presence of a definite pathological lesion suggesting the point of entry of the causal organism. The clue afforded by this has led to the elucidation of certain of the other anærobic infections of intestinal origin such as lamb dysentery, "struck," "pulpy kidney disease," "entero-toxæmia," etc., and it is probable that the causation of other hitherto obscure diseases such as the toxæmic conditions in pregnant ewes, grass-ill in lambs and grass sickness in horses may be cleared up by work on similar lines.

The object of this paper is to focus attention on these diseases and to record experiments which identify *Cl. welchii* toxin of the *ovitoxicus* type in the contents of the alimentary canal of lambs, sheep and horses in Scotland.

LITERATURE

Gaiger (1922) showed that braxy, which occurs in yearling sheep on many of the hill farms in Scotland, is caused by invasion of the stomach wall by *Cl. septique*. The circumstances which enable this invasion to take place have never been accurately determined, but immunisation against *Cl. septique* infection controls the disease. Dysentery in lambs was proved by Dalling (1926) to be due to the invasion of the intestinal wall by a type of *Cl. welchii* (the lamb dysentery bacillus). Though actual cases of dysentery have been produced by feeding cultures of the causal organism, difficulty has again been experienced in regularly infecting lambs by this method. Vaccines and antisera prepared from the causal organism, however, effectively control the disease. "Black disease" in Australia, which has a clinical resemblance to braxy, was investigated by Dodd (1917), Albiston (1927) and Turner (1930), and found to be an infectious necrotic hepatitis caused by the localisaion of *Cl. œdematiens* in the liver. This disease also can be controlled by means of vaccines prepared from the causal organism. More recently, work has been in progress in different parts of the world on the so-called "braxy-like" diseases of sheep, and several workers have reported that certain of these conditions are due to an acute toxæmia quite independent of tissue invasion by the causal organism. Thus, a braxy-like disease of

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sheep which occurs in Western Australia has been shown by Bennetts (1932) to be an acute toxæmia due to absorption from the bowel of a specific bacterial toxin resulting from the multiplication of an organism of the *Cl. welchii* type within the contents of the small intestine. Bennetts has named the disease "infectious entero-toxæmia," and the associated organism "*B. ovitoxicus*." McEwen and Roberts (1931) and McEwen (1933) investigated a specific disease of sheep ("struck") which occurs on the Romney Marsh. This disease is an enteritis and peritonitis which they attribute to a toxin derived from the alimentary canal and generally, but not necessarily, associated with an invasion of the body tissues by the causal organism. They identified the organism as a type of *Cl. welchii* and named it *B. paludis*. Difficulty was again encountered in the experimental reproduction of this disease by oral administration of a culture of the causal organism. Sheep were infected successfully, however, when massive doses—4 to 6 litres of a broth culture—were given, and the disease produced had all the characteristics of the naturally occurring cases of "struck." Gill (1932), working in New Zealand, and Oxer (1932) in Tasmania, detected in the small intestine of lambs which had died suddenly from pulpy kidney disease, a toxin which they believed to be that of *B. ovitoxicus*. In Wales, Montgomerie and Rowlands (1931), Montgomerie and Dalling (1933) and Montgomerie and Rowlands (1933) obtained similar results in the investigation of an apparently identical disease of lambs and of sudden deaths ("strike") in ewes in the spring. This, in effect, means that infectious entero-toxæmia is a disease of sheep now recognised in several widely separated parts of the world.

While investigations into the cause of these diseases of sheep were in progress, Wilsdon (1931), working independently, carried out a survey of the biological characteristics of some fifty strains of the *Cl. welchii* group. He isolated from a number of sources a strain, type "D," which differed from the *Cl. welchii* of gas gangrene (type A), from the lamb dysentery bacillus (type B) and from *B. paludis* (type C). He prepared toxins from the four types and studied the *in vitro* neutralising effect of antitoxic sera prepared from these toxins, by intravenous inoculation of mice with the toxin antitoxin mixtures. He found that type A antitoxin would not neutralise any but A toxin, B antitoxin neutralised to some extent all four toxins, C antitoxin neutralised all except D toxin, while D antitoxin neutralised A and D toxins. Following Wilsdon's work, an intensive and valuable survey of the multiplicity of toxins produced by some organisms of the *Cl. welchii* group was carried out by Glenny, Barr, Llewelyn-Jones, Dalling and Ross (1933). They found that filtrates of a single strain of each of the above types contain a number of toxic components, each with different properties, and that the serum prepared from such filtrates contains the specific antitoxins to these components in different proportions. Since the above-mentioned paper appeared these authors (reported by Montgomerie and Dalling, 1933) have found that at least two components in the toxin produced by *B. ovitoxicus* (Bennetts) are the same as those produced by cultures of the Wilsdon type "D," but sufficient work has not yet been done to establish whether these two strains of organisms are identical.

PROGRAMME

In 1933 it was decided to investigate the cause of some cases of sudden death in lambs and sheep in Scotland, and to concentrate in particular on an examination of filtrates prepared from the contents of the alimentary canal for the presence of toxins. It was also decided to examine acute cases of grass sickness in horses by similar methods. Toxins were to be detected by intravenous inoculation of mice, and the identity of the toxin was to be determined according to which of several known antitoxins was capable of neutralising the toxin present.

METHODS

In view of the conclusion by Glenny *et al.* that culture filtrates of *B. paludis* and the lamb dysentery bacillus are each capable of producing several toxins for each of which there is a specific antitoxin, one hesitates to give an opinion regarding the exact identity of a toxin present in filtrates obtained from intestinal contents, particularly when one considers the possible complexity of the anærobic flora in the digestive tract producing this toxin. It should, therefore, be stated that the toxins described in this paper have been identified by their "mouse-lethal" effect only; no attempt has been made to determine their power to produce necrosis or hæmolysis. Consequently, identifications are to be understood as relating to their "mouse-lethal" effect only.

Detection of toxins in the contents of the alimentary canal

The contents were in some cases diluted with an equal volume of broth prior to filtration (in cases of grass sickness in horses such dilution was never necessary). The material was filtered through paper pulp to obtain a clear filtrate, which was then drawn through a British Berkefeld candle. As a rule, by this method sterile filtrates were obtained, but when contaminating organisms were found in the filtrate they did not appear to affect the result of the toxin-antitoxin tests.

Identification of toxins

Several samples of serum containing known antitoxins were made available for this work through the courtesy of Dr. R. A. O'Brien, Director of the Wellcome Physiological Research Laboratories, and I am greatly indebted to Major T. Dalling for supplying the sera and for information and guidance regarding their use. The following are the more important samples of antitoxic sera used throughout this investigation:—

Cl. welchii type "A" — Two samples, labelled respectively G.G. 3256 A and C. 3305A, known to neutralise the "mouse-lethal" component in filtrates from Type A only.

Cl. welchii type "C" — Two samples, labelled respectively C. 1852 and C. 1971D, known to neutralise the "mouse-lethal" component in filtrates from types A, B and C, but not D.

Cl. welchii type "D" — Three samples, labelled respectively E.X. 10, E.X. 15 and E.X.19, known to neutralise the "mouse-lethal" component in filtrates from types D and A, but not B or C.

The nomenclature throughout this paper regarding the types of toxin and antitoxin is that used by Wilsdon.

Other samples of antitoxin serum used were as follows:—

B. ovitoxicus serum R2.1963 — The anti-lethal component for mice in this serum appears to be identical with that in the serum prepared from Wilsdon "D" filtrates.

Serum prepared from a filtrate of *B. sordellii*.
" " " " *Cl. histolyticus*.
" " " " *Cl. œdematiens* R.1492.
" " " " *Cl. septique* G.2756.
" " " " *B. paludis*.

When a filtrate was found to be toxic for mice, 0·1 c.c. of each sample of serum was mixed with a test dose of filtrate, which generally contained several "mouse-lethal" doses. The mixtures were allowed to stand at room temperature for not less than 30 minutes, after which they were inoculated intravenously into mice. Since the sera used contained antitoxins of a known type, the identity of the toxin present in a filtrate could be determined according to which particular serum prevented the test dose of filtrate from killing the mice.

The Identification of the Toxin of *B. ovitoxicus* in the Alimentary Canal of Sheep

A number of sheep and lambs received from outbreaks of disease in which the affected animals had a short illness with symptoms suggestive of a toxæmia have been investigated during 1933-34, and the result of some of these examinations is given in detail.

Case 1933-23.—An outbreak of disease in a flock of 168 sheep pastured on the natural policies of an estate and recently moved from there to a field of turnips. (Outbreak reported by Mr. W. J. Rice, M.R.C.V.S., Montrose, on December 12th, 1933.)

"The symptoms present themselves rapidly, and the affected sheep dies within six to eight hours after onset of the symptoms. The first sign is unsteadiness of gait; then the sheep lies down and carries its head elevated. As the case develops, the head is lowered to the ground and the animal literally 'bites the dust,' so that the mouth is full of soil when examination is carried out. This nibbling occurs shortly before collapse and death. Five have died in three days. The carcase of the sheep from which the full bowel length was sent showed no abnormality and would readily pass any meat inspection. There was a case of grass sickness in a horse within the policies in May and June, 1932."

In the portion of bowel received, numerous circular hæmorrhages, measuring approximately 1 cm. in diameter, were detected in the substance of the bowel wall. This type of lesion had been observed by Mr. Rice in some of the other animals which died. About 24 hours after death a filtrate was prepared from the contents of the small intestine, which had to be diluted with an equal volume of broth, and the filtrate was tested for toxicity by the intravenous inoculation of mice. A toxin was detected in a concentration such that 0·005 c.c. of filtrate was lethal for mice within 24 hours. The identity of this toxin was determined as shown in Table I.

TABLE I

The Result of Testing Filtrates from Case 1933-23.

Mice used; injections intravenously.

Test dose of filtrate ... 0·25 c.c.
Dose of serum ... ... 0·1 c.c.

Protection afforded by Different Sera against a Test Dose of Filtrate.

Type of Serum.	*Result.*
Cl. welchii type "A" (G.G. 3257A) ...	++
Cl. welchii type "C" (L.D.C. 1852) ...	++
Cl. welchii type "D" (E.X. 10)	LL
Cl. welchii serum, types "C" and "D" mixed	LL

+ = died. L = lived.

It will be observed that the only serum capable of neutralising the toxin present in the small intestine of this sheep was one prepared from *Cl. welchii* type "D." A second animal from the same outbreak was examined and a similar result was obtained.

In Table II are a few selected examples of the result obtained in the examination of filtrates prepared from the small intestine of lambs. The anti-toxins used for the determination of the type of toxin present in each case were *Cl. welchii* type "A," C.3,305A; type "C," C.1,917D; type "D," E.X.15, and one test was also carried out with types "C" and "D"

TABLE II.

Result of Examination of Filtrates obtained from the Small Intestine Contents of Lambs. Test Dose of all Filtrates used: 0·25 c.c. Serum Dose: 0·1 c.c. Mice used; injections intravenously.

Case.	History.	Lesions.	Toxicity of Bowel Filtrate.	Protection afforded by various antitoxins against a Test Dose Filtrate.
Selkirkshire ... 34-a	Lamb about 4 weeks' old found dead after a short illness	No definite lesions	0·1 c.c. + 0·075 c.c. + 0·05 c.c. + 0·025 c.c. L	A ++ C ++ D LL C & D LL Control ++
Duns 34-b	Lamb died suddenly	No definite lesions	0·075 c.c. + 0·05 c.c. + 0·025 c.c. + 0·01 c.c. +	A ++ C ++ D LL C & D LL Control ++
Roxburghshire 34-c	Lamb dysentery	Ulceration of bowel	0·0075 c.c. + 0·005 c.c. + 0·0025 c.c. +	A ++ C LL D ++ C & D LL Control ++
Roxburghshire 34-d	Lamb dysentery, same farm as 34-c	Ulceration of bowel	0·0075 c.c. + 0·005 c.c. L	A ++ C ++ D ++ C & D LL Control ++
Selkirkshire 34-e	Lamb about 4 weeks' old; believed to have died of grass-ill	No definite lesions	0·075 c.c. + 0·05 c.c. + 0·025 c.c. L	A ++ C ++ D LL C & D LL Control ++
Duns 34-f	Lamb about 5 weeks' old; believed to have died of braxy	No definite lesions. Culture medium inculated from heart blood and liver remained sterile	0·05 c.c. + 0·025 c.c. + 0·01 c.c. +	A ++ C ++ D LL C & D LL Control ++
Midlothian 34-g	Lamb 6 weeks' old; died suddenly	Both kidneys definitely pulpy	0·05 cc. + 0·025 c.c. + 0·01 c.c. L	A ++ C ++ D LL C & D LL Control ++

mixed. Two control mice were also inoculated with the test dose of filtrate to which 0·1 c.c. of saline was added. The *Cl. welchii* antitoxins are referred to in the table as A, C and D.

In all, filtrates were prepared from 55 lambs received at the laboratories for diagnosis. In 23 of these a toxic element was detected in the small bowel contents. Case 34-d is of particular interest, since two toxins, types C and D, were detected in the filtrate from the small intestine. This observation has already been made by Dalling (private communication). In the case of the 32 negative filtrates, the lambs had died after an illness lasting for more than a day, and amongst these were included a number of lambs which had died of louping-ill, tick-borne fever, joint-ill and necrotic hepatitis. Whilst it must be admitted that the detection of a toxin in the contents of the alimentary canal of a dead animal is no proof that it has been the cause of death, there is strong evidence in the work of Bennetts to suggest that absorption of the toxin does occur, since he has shown that sheep can be protected against "infectious entero-toxæmia" by immunisation of the animals against the specific toxin detected in the small bowel. In view of the work of Bennetts and others and the fact that negative filtrates were obtained from lambs which had died from specific infections such as louping-ill and tick-borne fever, there is good reason to believe that the cause of death in the lambs from which positive filtrates were obtained was infectious entero-toxæmia.

Case 34-*h*.—**A toxæmic condition occurring in an experimental flock of pregnant ewes under the control of Mr. W. C. Miller, M.R.C.V.S., of the Department of Animal Genetics, Edinburgh University.**

The ewes were lambing early in May and the

pasture had been growing luxuriantly for two weeks previously. Ten ewes were affected: seven died and three made a complete recovery. Filtrates from the undiluted small intestine contents of four were tested for toxicity. Three were negative and one was positive. It is noteworthy that the positive case was the only animal which became affected and died within 24 hours. The filtrate was lethal for mice when inoculated intravenously in a dose of 0·5 c.c., and the toxic element was identified as shown in Table III.

TABLE III

Result of Examination of a Bowel Filtrate obtained from a Pregnant Ewe which died from a Toxæmic Condition.

Mice used; injections intravenously.

Test dose of filtrate ... 0·5 c.c.
Dose of serum ... ... 0·1 c.c.

Protection afforded by Different Sera against a Test Dose of Filtrate.	
Type of Serum.	*Result.*
Cl. welchii type " A " (G.G. 3257A) ...	++
Cl. welchii type " C " (L.D.C. 1852) ...	++
Cl. welchii type " D " (E.X. 10) ...	LL
Types " C " and " D " mixed	LL

This result shows that *Cl. welchii* toxin type " D " was present in the small intestine contents of a ewe which died of an acute toxæmia during pregnancy.

As a result of these examinations, it may be concluded that there occurs in Scotland a disease of sheep, closely similar to, if not identical with, that which occurs in Western Australia and named by Bennetts " infectious entero-toxæmia." This disease may be known to the clinician under a variety of names, amongst which there may be included some cases of a braxy-like disease, some of lamb-dysentery, some of grass-ill and, possibly, some forms of toxæmia in the pregnant ewe.

The Identification of the Toxin of *B. ovitoxicus* in the Alimentary Canal of Horses, and attempts to Isolate the Organism

In 1932 a complete bacteriological examination of several horses killed while affected with acute grass sickness was carried out. No organisms which could be associated with the cause of the disease were detected in any of the glandular abdominal organs, brain or spinal cord. Saline emulsions of brain and spinal cord and saline emulsions of the abdominal organs when inoculated either subcutaneously, intravenously or intracerebrally into horses, mice, guinea pigs and rabbits, failed to cause disease in the inoculated animals except in the case of a horse which died of a septic peritonitis, and from which a streptococcus was isolated. In view of these results and the previous more or less negative nature of the findings in the examination of horses affected with grass sickness, it was decided to confine the bacteriological enquiry in the 1933 season to an examination of the contents of the alimentary canal, and in the first instance filtrates were prepared from the fluid in the stomach and small intestine of a number of cases of grass sickness.

Case 1933-5.—Forfar district. An eight-year-old mare. The second case on this farm in 1933. Animal had been working as a pair with Case 1933-2. First noticed ill a.m. June 18th; 6.30 p.m. diagnosed as a case of acute grass sickness by Mr. T. M. Inglis, M.R.C.V.S., Forfar. Pulse 60; temperature 101·3° F. Sweating; muscular tremors. June 19th, 1 p.m., no fæces passed; pulse 100; temperature 100·2° F.; animal much worse; tried to drink, but was unable to do so. Saliva dribbling from the mouth; uneasy at times; slightly staggering gait; patchy sweating; body surface cold; died after midnight. *Post-mortem* carried out on the morning of June 20th. Stomach greatly distended and contained about 6 gallons of semi-solid material; small intestine congested in parts; large intestine full, contents dry and coated with blood. Small colon and rectum almost empty. Liver paler than normal.

Within twelve hours of death, a quantity of the liquid contents from the stomach and small intestine was transferred to separate sterile 2-gallon cans. Sixteen hours later a filtrate was prepared from each sample of contents and, as a preliminary test, equal quantities of the filtrates were blended and inoculated intravenously into mice, as shown in Table IV.

TABLE IV

Test for Toxicity of Mixed Filtrate from Stomach and Small Intestine Contents of Case 1933-5.

Two mice used at each dose; injections intravenously.

Dose.		
1·0 c.c.	++	Deaths occurred within six hours.
0·5 c.c.	++	
0·25 c.c.	++	
0·1 c.c.	L +	

+ = died. L = lived.

This shows that a toxin fatal for mice was present in a sterile filtrate prepared from the contents of the stomach and small intestine of a horse which had died of acute grass sickness. It was then necessary to determine the nature of this toxin, and with this end in view, neutralisation tests with various antitoxins were carried out. The result is shown in Table V.

It will be seen that the only serum which contained antitoxin capable of neutralising the toxin present in this filtrate was E.X.10. This serum contains antitoxin capable of neutralising the " mouse-lethal " component in filtrates prepared from *Cl. welchii* type "D" (Wilsdon). Since

TABLE V

Protection afforded by Different Antisera against the Stomach and Intestinal Filtrate of Case 1933-5.

Two mice inoculated intravenously with each mixture.
Test dose of filtrate ... 0·5 c.c.
Dose of serum ... ... 0·1 c.c.

Type of Serum.	Result.	
Sordellii	++	Deaths occurred within six hours.
Œdematiens	++	
Histolyticus	++	
Cl. welchii. Type "A" Gas gangrene. G.G. 3257A	++	
Cl. welchii. Type "C" Lamb dysentery. L.D.C. 1852 ...	++	
Cl. welchii. Type "D" Wilsdon. E.X. 10	LL	
Cl. septique. G.2576	++	
Normal horse serum	++	
Saline plus the unknown toxin ...	++	

+ = died. L = lived.

this experiment was repeated three times, and on each occasion with a similar result, it may be concluded that the toxin detected in the digestive tract of a horse which had died of acute grass sickness was similar to, if not identical with, *Cl. welchii* toxin type "D" (Wilsdon) or *B. ovitoxicus* toxin (Bennetts). Finally, E.X.10 serum was titrated against a test dose of filtrate to determine its value in neutralising the toxic filtrate. The result is shown in Table VI, from which it will be seen that this serum was highly specific.

TABLE VI

Titration of Serum E.X. 10 against a Test Dose of Filtrate.

Mice used; injections intravenously.

Serum E.X. 10.	Stomach and Bowel Filtrate Mixed.	
Dose.	Dose.	Result.
0·01 c.c.	0·5 c.c.	LL
0·001 c.c.	0·5 c.c.	LL
0·0001 c.c.	0·5 c.c.	++
0·00001 c.c.	0·5 c.c.	++

+ = died. L = lived.

Further tests carried out separately with the filtrates obtained from the contents of the stomach and small intestine showed that the concentration of toxin was practically equal in the stomach and bowel filtrates.

Since the toxin of *Cl. welchii* type "D" had been detected in the contents of the alimentary canal of this horse, it was presumed that the organism responsible for the production of this toxin would be present in the contents of the alimentary canal, and an attempt was made to detect its presence. Accordingly, a four litre flask of 1 per cent. Witte peptone horse-flesh broth was seeded with a small quantity of contents from the stomach, small and large intestine. This was incubated for 12 days at 37°C., and a filtrate prepared from this mass culture was tested for toxicity in mice by intravenous inoculation. The result is shown in Table VII.

TABLE VII

M.L.D. of Mass Culture Filtrate Case 1933-5.

Mice used; injections intravenously.	
0·25 c.c.	++
0·1 c.c.	++
0·075 c.c.	LL
0·05 c.c.	LL

A test dose containing 0·5 c.c. of this filtrate was employed and various sera were tested to determine their power to neutralise the toxin present. The result is shown in Table VIII.

TABLE VIII

Identification of the Toxin present in the Mass Culture Filtrate from Case 1933-5.

Mice used; injections intravenously.

Type of Serum.	Dose.	Dose of Filtrate.	Result.
	c.c.		
Œdematiens	0·1	0·5	++
Histolyticus	0·1	0·5	++
Cl. septique G.G. 2756 ...	0·1	0·5	++
Normal horse serum ...	0·1	0·5	++
Cl. welchii type "A" (G.G. 3256A)	0·1	0·5	++
Cl. welchii type "C" (L.D.C. 1852)	0·1	0·5	++
Cl. welchii type "D" Wilsdon E.X. 10 ...	0·1	0·5	LL
	0·01	0·5	LL
	0·001	0·5	LL
	0·0001	0·5	+L
Controls: saline	0·1	0·5	++

This result suggested that the predominant toxin-producing organism present in the digestive tract of Case 1933-5 was *Cl. welchii* type "D" (Wilsdon). Attempts were therefore made to isolate this organism in pure culture. For this purpose, the contents of the stomach and small bowel were dried on porous porcelain plates, and the dry material obtained was powdered and sown on the surface of blood agar plates, which were incubated anærobically. Single colonies of *Cl. welchii* were observed, and several of these picked off into meat broth. The cultures obtained were subsequently examined in the hope that *Cl. welchii* type "D" had been isolated. In all cases, however, the toxin produced by these cultures was neutralised by *Cl. welchii* antitoxin type "A" gas gangrene.

Case 1933-2.—A mare, rising 4 years old. This animal was working as a pair with Case 1933-5. It had been at grass since June 1st, but was working upon occasion with the other horses. Worked all day on June 12th, and was at grass until June 16th, when it was again put to work. It worked about an hour and was noticed to be ill.

3 p.m.—A purgative bolus administered.
6 p.m.—A "colic draught" administered.
8 p.m.—Case diagnosed by Mr. T. M. Inglis, M.R.C.V.S., Forfar, as a typical case of acute grass sickness. Animal restless; marked tremor; abdomen distended; pulse over 100.
10 p.m.—A "colic draught" administered.
17.6.33, 5 a.m.—A "colic draught" administered.
9 a.m.—No fæces passed during the night; animal very restless; eye sunken; anxious expression; regurgitation from the stomach; sweating very marked; salivation; animal getting weak; body and leg muscles shaking continuously. Death occurred about 1.15 p.m., and the *post-mortem* examination was carried out at 3 p.m. Stomach greatly distended with gas, contents semi-solid. Small intestine full of watery contents; large intestine full; contents dry and doughy.

A mixed filtrate of stomach and small bowel contents was prepared. Mice inoculated intravenously with 1·0 c.c. of this filtrate remained quite healthy.

Although no toxin had been detected in filtrates prepared from this case, an attempt was made to determine whether *Cl. welchii* type "D" was present in the contents of the digestive tract. This was done by means of a mass culture filtrate in the same manner as in Case 1933-5. The filtrate was found to be toxic for mice in a dose of 0·05 c.c. and when a test dose of 0·25 c.c. was used, the only sera capable of neutralising this toxin were *Cl. welchii* type "D" Wilsdon (E.X.10) and *B. ovitoxicus* serum (R2. 1963). As in the previous case, attempts were made to isolate the organism in pure culture from the contents of the alimentary canal, but all the single colonies of *Cl. welchii* examined produced the type "A" toxin.

It may be concluded that although free toxin of *Cl. welchii* type "D" was not detected in the contents of the digestive tract of Case 1933-2, the presence of the organism capable of producing this toxin was demonstrated by indirect methods.

Case 34-1.—Reported by Mr. G. R. Jamieson, M.R.C.V.S., Haddington. A two-year-old filly, which had been at grass all winter. Noticed slightly dull before midday on May 18th. Diagnosed by Mr. Jamieson as a case of acute grass sickness at 4.30 p.m. Typical muscular tremors; patchy sweating; pulse fast and weak; respirations accelerated; temperature about normal; the animal died at 9.30 p.m. the same day. *Post-mortem* examination was not carried out until May 21st at 11.30 a.m.

Separate filtrates prepared from the contents of the stomach and ileum were tested for toxicity. The filtrate from the stomach contents was non-toxic. The result of the examination of the filtered contents of the ileum is shown in Table IX.

This result shows that *Cl. welchii* toxin type "D" was present in the small intestine of this acute case of grass sickness in which the animal died within twelve hours of the time when symptoms were first observed.

An attempt was made to isolate *Cl. welchii* type "D" from the alimentary canal of this horse. Accordingly, tubes of horse-flesh broth were seeded separately with material from the stomach and small intestine. These were incubated at 37°C., and as soon as growth was evident, subcultures on meat broth were made for nine generations. Films prepared from these cultures had the appearance of contaminated cultures of *Cl. welchii*. These cultures were sown on the surface of blood agar plates and incubated anaerobically. Single colonies of *Cl. welchii* were obtained and several picked off into horse-flesh broth. No obvious contaminants were observed in films prepared from these cultures, and they produced *Cl. welchii* toxin type "D." Further work will be required to be done with these cultures, however, before their exact identity is established.

Case 34-6.—Forfar district. A three-year-old gelding. First observed ill at noon on June 1st; diagnosed as an acute case by Mr. T. M. Inglis, M.R.C.V.S., and Mr. T. Anderson, M.R.C.V.S. No fæces passed after the animal was first observed ill. Abdomen distended; very slight sweating; mucous membranes slightly injected; animal restless, lying down occasionally. Destroyed by shooting and bleeding at 12.20 p.m. on June 2nd. The *post-mortem* was carried out immediately.

TABLE IX.

Result of Examination of a Bowel Filtrate from Case 34-1: Acute Grass Sickness.

Mice used; injections intravenously.
Test dose of filtrate ... 0·5 c.c.
Dose of serum ... ... 0·1 c.c.

Post-mortem.	Toxicity of Bowel Filtrate.			Toxin Antitoxin Reaction.	
Large intestine full; not markedly impacted. Blood vessels in mesentery congested and omentum very red. Flushing of the peritoneal surface of the bowel in patches. Stomach greatly distended with gas and fluid. Spleen slightly enlarged. Both kidneys very dark and definitely pulpy. Definite endocarditis most marked on right side.	1·0 c.c.	+	4 hours	A	+ + + + + +
	0·5 c.c.	+	6 hours	C	+ + + + + +
	0·25 c.c.	+	6 hours	D	L L L L L L
	0·1 c.c.	+	overnight	C & D	L L L L L L
	0·075 c.c.	+	overnight	Controls	+ + + + + +
	0·05 c.c.	L			
	0·025 c.c.	L			

TABLE X.

Result of Examination of a Filtrate from Case 34-6: Acute Grass Sickness.

Mice used; injections intravenously.
Test dose of filtrate ... 0·5 c.c.
Dose of serum ... ... 0·1 c.c.

Post-mortem.	Toxicity of Bowel Contents.	Toxin Antitoxin Reaction.
Large intestine: Full; contents fairly dry and adhering to bowel wall; black coating on fæces. *Small intestine*: Contents fluid, but scanty; mucous membrane pale in colour. *Stomach*: Very full of semifluid contents. Some sandy material found in the contents. *Kidney*: Slightly mottled, but firm in consistency. No other abnormalities observed.	0·05 ++ 0·025 + 0·01 L	A ++++ C ++++ D L L L + C & D L L L L Controls ++++

+=died. L=lived.

TABLE XI.

Result of Intravenous Inoculation of Horse 862 with Filtered Stomach and Intestinal Contents from Cases of Acute Grass Sickness.

Date and Time.	Inoculum.	Pulse.	Temperature.	Respirations.	Symptoms.
21.6.33 10 a.m.	400 c.c. intravenously of stomach and small bowel filtrate from Case 1933-5	—	—	—	Lay down; very distressed; profuse sweating and salivation; tremors of muscles of the shoulders and quarters. Fæces were passed at frequent intervals. The acute symptoms passed off and the animal was put to grass.
22.6.33 10 a.m. 4 p.m.	600 c.c. intravenously of stomach and bowel filtrate from Case 1933-2.	72	101	—	Chewing movements of the jaws; difficulty in swallowing; regurgitation from the stomach; small quantities of food being returned; eye sunken, injected mucous membrane; slight tremor of shoulder muscles. Not much change in condition.
23.6.33 9.30 a.m. 10 a.m.	650 c.c. intravenously of stomach and bowel filtrate from Case 1933-5.	58	99·4	6	Renewed outbreak of sweating and salivation; marked tremors of the muscles.
24.6.33 9.30 a.m.		64	100·6	6	Animal dull and standing alone; champing of jaws and salivation; slight tremor of shoulder muscles; slight colicy pains noticed. Animal observed crouching occasionally.
25.6.33 9.30 a.m.		62	101·4	24	Symptoms similar to previous day; respirations accelerated.
26.6.33		66	98·6	8	Symptoms similar; crouching movements more frequent.
27.6.33		62	99·2	10	Dull; standing alone.
28.6.33		88	100	10	Dull; tremors of shoulders and quarters. 3 p.m. symptoms became exaggerated; animal trembling violently and sweating profusely. Was led into a loose box and there collapsed and died within a few minutes.

Filtrates were prepared from the stomach and small bowel contents. These were tested in the usual way (Table X).

From this result it may be concluded that *Cl. welchii* toxin type "D" (Wilsdon) was present in the ileum of this horse, which was killed about 24 hours after the symptoms of grass sickness were first observed.

In a limited number of cases filtrates have been obtained from horses which died from causes other than grass sickness. In one case the animal died while at work, and was allowed to lie unopened for about two and a half days, when a filtrate was prepared from the small bowel contents. In other cases the animals were destroyed while suffering from an injury. In one case the animal was in a very debilitated condition after giving birth to a foal and was suffering from laminitis. In all instances the filtrates prepared from the small bowel contents of these animals were non-toxic when inoculated into mice.

During the 1933 season and the commencement of the 1934 season, 21 cases of acute grass sickness in horses have been examined, and the toxin of *B. ovitoxicus* has been detected in the small intestine contents of three. Attention might here be directed to the work of Montgomerie, who examined 59 cases of typical pulpy kidney disease in lambs. In 39 of these the presence of a toxic element was demonstrated. Of the 20 negative filtrates, five were known to be from "chronic" cases, the lambs having lived for more than 24 hours after the appearance of the symptoms. In the examination of cases of acute grass sickness, only one animal has been obtained within twenty-four hours after the commencement of symptoms and this was a positive case.

The Effect of Intravenous Inoculation of a Horse with Filtrate from an Acute Case of Grass Sickness.

During the 1933 season filtrates prepared from several acute cases of grass sickness were tested for toxicity in horses as well as in mice. While a number of these filtrates appeared to be toxic for horses when injected intravenously in large doses, the only filtrate toxic for mice was that obtained from Case 1933-5. Since the toxin present in this filtrate had been identified, the effect it produced when inoculated intravenously into horses was of considerable interest and the result is recorded in detail (Table XI).

Post-mortem Examination

The stomach had apparently been so distended that it either ruptured at the point of death, or in the course of opening the abdomen, and a large quantity of the contents was free in the peritoneal cavity. The only other abnormalities noted were peritonitis and sub-endocardial hæmorrhages on the valves and elsewhere.

Since Horse 862 developed acute toxic symptoms following inoculation with toxin present in the bowel of a horse affected with grass sickness, and since it was known that the toxin was that of *Cl. welchii* type "D," an experiment was arranged to determine if type "D" antitoxin E.X.19 would prevent these symptoms. The result is shown in Table XII.

TABLE XII

The Protection afforded in Horses by *Cl. welchii* type "D" Antitoxin against the Toxic Filtrate obtained from Case 1933-5.

Injections intravenously. Serum used: E.X.19.

Date and Time.	Horse 863. Inoculum.	Horse 875. Inoculum.
3.8.33 11.30 a.m.	100 c.c. E.X.19 intravenously. 100 c.c. E.X. 19 subcutaneously.	100 c.c. normal horse serum intravenously 100 c.c. normal horse serum subcutaneously.
3.30 p.m.	60 c.c. of filtrate + 1 c.c. E.X. 19 in contact 1 hour then injected intravenously.	60 c.c. filtrate + 1 c.c. normal horse serum in contact 1 hour then injected intravenously.
Result.		
	Animal slightly dull, and lay down after injection. In 30 minutes it was feeding normally.	Profuse sweating; salivation; marked tremors; animal collapsed and was unable to rise during the remainder of the day, but was able to stand the following morning.
4.8.33 11 a.m.	50 c.c. filtrate + 0·2 c.c. E.X. 19 in contact for 1 hour then injected intravenously.	50 c.c. filtrate + 0·2 c.c. of normal horse serum in contact for 1 hour then injected intravenously.
Result.		
	No reaction ...	The symptoms previously described were continued and the animal died at 2.15 p.m. the same day. Acute congestion of the subcutaneous and intra-pleural capillaries on the left side. Stomach distended with gas and about 4 gallons of fluid.

From this result it may be concluded that an antiserum prepared from *Cl. welchii* type "D" (Wilsdon) is capable of protecting a horse against the development of toxic symptoms and death following intravenous inoculation with a toxic element present in the contents of the alimentary canal of a horse which had died of acute grass sickness.

As a control for these experiments, a filtrate obtained from the small intestine contents of a normal horse was inoculated intravenously into Horse No. 861. The dose employed was 520 c.c. Sweating followed inoculation and the animal lay down. After a short time, this horse recovered, and the following day was inoculated with 750 c.c. of the same filtrate. Fairly pronounced sweating and generalised tremor occurred, followed by recovery after about an hour.

Oral Administration of Cultures of *B. ovitoxicus* to Horses

At the time these experiments were carried out a culture of *Cl. welchii* type "D" had not been isolated from horses affected with grass sickness, but it was decided, in view of the results which had been obtained, to determine the effect of oral administration of cultures of this organism to horses. The culture used was *B. ovitoxicus* R.2. Bennetts, after a number of unsuccessful attempts, produced infectious entero-toxæmia by feeding this culture to sheep in which a bowel stasis had been produced, and it was decided to adopt a similar procedure in the experiments on horses. Accordingly, a preliminary test was carried out with three horses. These were housed in loose boxes and fed on hay and oats.

Horse I.—Control in which bowel stasis was produced.

This animal was fed the following mixture by stomach tube four times a day for four consecutive days: powdered opium 2 gms. in 200 c.c. of milk, and 12 c.c. of tincture of belladonna. On the fifth day the same mixture was given twice, and on the sixth and seventh day one dose was given. Prior to treatment, the animal defæcated on an average six times in 24 hours, but during the first six days' treatment, it defæcated on an average twice every 24 hours. This animal became dull and listless, but continued to feed satisfactorily during the experiment, and the pulse rate remained normal.

Horse II.—Control which received alkali plus culture.

To this animal there was administered by stomach tube 500 c.c. 10 per cent. aqueous solution of sodium bicarbonate, followed by 700 c.c. of R.2 culture, three times a day for two consecutive days. It received two litres of sodium bicarbonate solution, followed by culture twice a day for the next two days, and on the two subsequent days it received the same dose of alkali, followed by 8½ litres of culture. The animal was definitely dull on the second day of treatment and refused food; pulse increased slightly from 45 to 48. Throughout the experiment the animal fed indifferently and lost condition, but no serious symptoms were noted.

Horse III.—Bowel stasis, plus alkali, plus culture.

In this animal a bowel stasis was produced by the same treatment as that adopted for Horse I, and alkali and culture were administered as in Horse II. Prior to treatment, Horse III defæcated on an average six times in 24 hours, but during the first six days of treatment it defæcated on an average twice every 24 hours. On the second day of the experiment this animal refused food; the pulse rate rose from 48 to 68; it was restless and a slight tremor of the shoulder muscles and muscles of the quarter was observed. The abdomen was distended. The symptoms at no time became acute. After the third day the animal improved, and thereafter no definite symptoms were noted.

When this experiment was completed, Horse I was inoculated intravenously with 15 c.c. of *B. ovitoxicus* toxin. It became very distressed; sweated profusely and collapsed about 30 minutes after inoculation. Within two hours it had made an apparent recovery, and was able to stand, though very weak. At 8 a.m. the following morning it was standing, the respirations were very laboured and the animal was trembling violently. At 9 a.m. it collapsed. There were occasional violent struggles and at this stage the animal was destroyed. On *post-mortem* examination the most obvious lesion was a patchy congestion of the small intestine. The first few feet of the duodenum appeared normal. The congested areas were usually about 1 foot in length. The wall of the small bowel appeared to be constricted in bands, the bowel being ballooned between the constrictions. The kidneys were of firm consistency, but congested, and the surface had a dark mottled appearance. No other definite lesions were noted.

Horses II and III were also inoculated with 15 c.c. of the same toxin. Neither of these animals reacted, and on the following day they were given 30 c.c. of toxin and again no symptoms developed.

This experiment suggested that the two animals which received *per os* frequent doses of *B. ovitoxicus* culture had developed immunity against a test dose of toxin capable of killing Control Horse I, to which culture had not been administered. This apparent production of immunity indicated that some absorption of toxin had occurred, and in view of the experiments by McEwen, who found it necessary to feed four to six litres of *B. paludis* culture to sheep in order to cause toxæmia, it was decided to feed a massive single dose of *B. ovitoxicus* culture to a horse in which bowel stasis had been

produced. Accordingly, Horse IV was fed four times daily on two consecutive days with the following mixture: 4 gms. of powdered opium in 200 c.c. of milk and 12 c.c. tincture of belladonna. On the second day at 10 a.m. it received the opium and belladonna treatment; at 11 a.m. 2 litres of 10 per cent. aqueous solution of sodium bicarbonate and 24 litres of a broth culture of *B. ovitoxicus*, which had been incubated for 13 hours. Within an hour after administration the horse was very restless and commenced to walk round the loose box; this alternated with short periods of decumbency; the animal lay down and rose every few minutes, apparently finding comfort in no position. When lying, the head was occasionally turned anxiously towards the abdomen. There were periods when the animal backed into a corner of the loose box and stood with his hind quarters pressed against the wall. The respirations became accelerated and accompanied by a light snore. There was a marked tremor of the shoulders and quarters and profuse sweating was observed at 8 p.m. At 9 p.m. the animal was walking continuously in a circle round the box. The abdomen was obviously distended. All the symptoms became much exaggerated and, finally, about 9.30 p.m. the animal dropped suddenly, with the legs under the body, and died immediately. The *post-mortem* examination was carried out at 9 a.m. the following morning.

Stomach.—Distended with gas; the contents were semi-solid and occupied about half the volume. A sample of this material was retained for filtration.

Omentum and Mesentery.—Blood vessels congested and hæmorrhages present under the peritoneum at the attachment of the mesentery and bowel.

Small Intestine.—Contents fluid. Gas also present. The mucous membrane appeared normal, except in the ileum, where there was a slight congestion, and the contents at this part were blood-stained. A sample of the contents was taken for filtration.

Large Intestine.—The contents in the first part were soft, but further back, dry and adherent to the mucous membrane.

Kidneys.— The kidneys are definitely pulpy. Considerable portions of each kidney were very dark in colour. These areas were much softer than the other parts of the kidney.

Liver and Spleen.—No abnormality noted.

Thoracic Cavity.—Small hæmorrhages under the epicardium of the auricles. Sub-endocardial hæmorrhages in the left ventricle. Blood very dark in colour. No marked alteration in the lungs.

From the symptoms and *post-mortem* findings, it was considered probable that this animal died as a result of an acute toxæmia, due to absorption of toxin from the digestive tract. It was also believed that multiplication of the organisms which had been fed had occurred in the digestive tract, and particularly in the small intestine. In support of this belief, there is the evidence that in mice the toxic dose of culture at the time of feeding was 0·1 c.c. After death the toxic dose of the stomach filtrate was 0·25 c.c., whereas the toxic dose of the small intestine filtrate was 0·00075 c.c. These toxic filtrates were neutralised by *Cl. welchii* antitoxin type "D."

It cannot be claimed that the horse inoculated with intestinal filtrate from an acute case of grass sickness, nor the animal to which a culture of *B. ovitoxicus* was administered by stomach tube, died of typical grass sickness, but the symptoms exhibited resembled the so-called toxic symptoms of that disease. Against this it should be stated, however, that these symptoms may be common to a number of acute toxæmic conditions.

DISCUSSION

It is generally recognised that bacteria mainly cause disease by invading the host and multiplying within its tissues. Diseases of an obscure nature, characterised by symptoms suggestive of a toxæmia followed by a negative bacteriological examination of the tissues, are, however, of common occurrence in domesticated animals. In such cases, poisoning is often suspected, because the animal is attacked suddenly at a time when it appears to be in perfect health. Such conditions have sometimes been loosely referred to as an "auto-intoxication," or as an "intestinal intoxication," but very often nothing of a definite nature emerges at the *post-mortem* examination and no accurate diagnosis can be made.

It is well known that in the intestine of animals, especially those whose main diet is obtained by grazing, there occurs a multiplicity of organisms of the anærobic type and, especially, of the *Cl. welchii* group.

Under normal natural conditions it seems that either no toxins are produced by these organisms in the intestine, or that the amount is so very small that elaborate tests fail to show their presence. From the work of Bennetts, it became obvious that under certain conditions, toxins were elaborated in the intestine of sheep, and under experimental conditions these toxins were shown to produce the death of the animals. McEwen, Gill, Montgomerie and others have confirmed these general findings in different parts of the world.

From the work recorded in this paper, it would appear that sheep in Scotland may, under conditions not yet understood, develop disease and die from the absorption of anærobic toxins elaborated in the intestine. The chief toxin seems to be that of the *ovitoxicus* type of

Cl. welchii. Further, we have shown in this paper that in a number of cases of acute grass sickness in horses, a similar type of toxin was present in the alimentary canal. Experimental evidence is produced which indicates that this type of toxin may play an important part in the causation of grass sickness.

The production of these toxins appears to coincide with the nature of the herbage to which the animals have access, for, especially in Australia, outbreaks of the so-called pulpy kidney disease in sheep, which Bennetts has shown to be associated with the presence of the *ovitoxicus* type of toxin in the intestine, occur mainly in districts where special crops are grown for the sheep, or where pastures are top dressed. In connection with grass sickness in Scotland, it will be remembered that this disease followed an improvement of the pastures, and especially after the introduction of wild white clover.

Much more work is necessary on all these various points before definite conclusions can be drawn.

SUMMARY

Filtrates prepared from the intestinal contents of lambs, sheep and horses, which died after an acute illness under circumstances suggestive of a toxæmia, have been shown to contain a toxin lethal to mice when injected intravenously. This toxin is neutralised by antisera prepared from *B. ovitoxicus* (Bennetts) and *B. welchii* (Wilsdon type "D"). Amongst some of the recognised clinical conditions in which this toxin has been detected there may be included certain cases of lamb dysentery, grass-ill, a braxy-like disease in lambs and older sheep, a toxæmic condition in pregnant ewes and grass sickness in horses.

In a limited number of examinations made, toxins have not been detected in filtrates prepared from the small intestine contents of normal animals and carcases.

Acknowledgments

This work has been carried out under the ægis of the Animal Diseases Research Association, and forms a preliminary report on a bacteriological investigation of grass sickness in horses which is being carried out by the author in collaboration with Messrs. A. Brownlee and D. R. Wilson, under the general direction of Dr. J. Russell Greig.

We wish to record our sense of gratitude to those from whom help has been received: to the Scientific Committee of the Association, under the Convenership of Professor T. J. Mackie, for constructive criticism and advice; to the many veterinary surgeons who have so willingly provided us with material for examination, particularly the practitioners in Perthshire and Forfarshire; and to Dr. R. A. O'Brien and Major T. Dalling, of the Wellcome Physiological Research Laboratories, for the antitoxins used in this work.

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The Experimental Pathology Section of Congress held its opening session at the Royal (Dick) Veterinary College on the morning of Tuesday, July 31st, when, despite the counter-attraction of the tour to the Trossachs, there was an excellent attendance under the Chairmanship of Dr. J. Russell Greig, of the Moredun Institute. The subject under discussion was "Entero-toxæmia in Herbivorous Animals—its Possible Bearing on Grass Sickness in Horses," and the Chairman immediately called upon the writer of the Congress paper on the subject, Dr. W. S. Gordon, of Edinburgh, to introduce his paper.

INTRODUCTION

Dr. W. S. Gordon, at the call of the Chairman, made the following introductory remarks:—

In presenting this paper on toxæmia for your discussion this morning, I fully realise that it is a subject about which we have yet to learn many things. In the report which has already been circulated, however, there are certain definite findings.

In the first place, the toxin of *Cl. welchii* type D (Wilsdon) or *Cl. welchii* toxin of the *ovitoxicus* type (Bennetts) has been detected in the contents of the alimentary canal of lambs, sheep and horses in Scotland.

Amongst the recognised clinical conditions in which this toxin has been detected there may be included certain cases of lamb dysentery, grass-ill, a braxy-like disease in lambs and older sheep,

a toxæmic condition in pregnant ewes and grass sickness in horses.

The last-named disease is probably the one of greatest interest since it has baffled investigation for a number of years. The work on grass sickness in horses must be regarded as in its experimental stages only, and it must be remembered that we are just becoming familiar with a technique suitable for the examination of the contents of the digestive tract, particularly for the presence of toxins and toxin-producing organisms. As time goes on, this technique, in all probability, will be improved, and cases which at the present time are accepted as negative, may, with an improved technique, be found to be positive.

Since we have now completed the first stages in the examinations of horses affected with acute grass sickness, there is some evidence additional to that which is recorded in the paper.

We have examined for the presence of toxins filtrates prepared from the contents of the digestive tract of 29 horses affected with acute grass sickness. In eleven of these a toxic element has been detected in the small bowel contents. The nature of the toxin has been determined in six cases as the toxin of *Cl. welchii* type D (Wilsdon) or *B. ovitoxicus* (Bennetts). In two cases the nature of the toxin has not yet been determined, and in the three remaining cases the toxin was not detected in a sufficiently high concentration to enable its nature to be determined.

Discussion

In the absence (on convalescence following a serious illness) of Professor S. H. Gaiger (Liverpool), his paper in opening the discussion was read by Mr. G. Davies (Liverpool).

Professor Gaiger's paper was as follows:—

Dr. Gordon's contribution to our knowledge of entero-toxæmia is very welcome. This growing subject is one of some difficulty, and Dr. Gordon is to be congratulated on the manner in which he has presented his case.

The Australian investigations leave little room for doubt that there is in Australian sheep, and particularly in the younger ages of this species, a condition in which varieties of *Cl. welchii* multiply mainly in the alimentary canal contents and produce toxins, these toxins being absorbed into the system and in some cases causing death. A similar condition has recently been shown to occur in Britain, and Mr. Gordon's work affords further confirmation of this. He has demonstrated the presence of an alimentary toxin in three adult sheep which died showing toxæmic symptoms, 23 lambs which died showing acute symptoms, and three out of 21 cases of acute grass sickness in horses.

Theoretically, there is no reason why a bacterium should not act specifically in the manner described. Amongst the anærobes we are already familiar with (1) species which are not tissue invaders but produce outside the body a powerful toxin which may be fatal upon ingestion, *e.g., Cl. botulinum*; (2) species which live in wounds but are not tissue invaders in the true sense, and produce in these wounds a toxin which may be fatal upon absorption, *e.g., Cl. tetani*; and (3) species which are true tissue invaders and live, multiply and produce their toxins within the living body tissues, *e.g., Cl. septique.*

As a variation of this it must now be accepted that another anærobe, namely, *Cl. welchii,* may live and produce toxins in the alimentary canal, may or may not show tissue-invasive properties, and, by the absorption of its toxins from the alimentary canal, may cause illness and death in animals.

Now apparently we have to recognise that *Cl. welchii* is a group of varieties, or types A, B, C and D as they have been called, each type producing in the main a specific toxin though also producing group toxins common to one or more of the other types. The occurrence of such varieties in a bacterial species is analagous to what has already been known for some time, as, for example, in *Cl. botulinum.* The types of *Cl. welchii* vary in their tissue-invasive properties, for example as between the lamb dysentery and ovitoxicus types.

Dr. Gordon suggests that possibly quite a variety of conditions met with at the commencement of the grazing season may be caused by bacterial entero-toxins absorbed into the system, and he rightly stresses the usefulness of this line of investigation in animal diseases research.

I am glad to find that Dr. Gordon in his researches has emphasised the need to examine for entero-toxins the alimentary contents of animals dead of all kinds of ailments, not only toxæmic conditions. His failure to detect toxins in the bowel in non-toxæmic fatal diseases strengthens the argument in favour of the importance of entero-toxins when found. Personally, I should like to see a greater volume of work done at several centres upon this point. In a recent series of experiments at Liverpool with material supplied to me mainly by Mr. G. D. W. Davidson, M.R.C.V.S., of Castle Douglas, I examined the bowel contents for toxicity in nine sheep, seven lambs and six bovines, but in this series only in two sheep and one lamb was evidence of toxicity found.

My chief interest in Dr. Gordon's paper lies in his application of entero-toxin technique to equine grass sickness, and in his success in detecting entero-toxins in three out of 21 acute cases. This success may not sound very encouraging to some readers, but one should remember that one positive result is worth many negatives when applying new technique in the investigation of an obscure disease, and I trust Dr. Gordon will follow up his success along these lines, slight though it may have been.

Investigations into grass sickness have given amazingly meagre results, considering the enormous expenditure of time and effort.

I notice that Dr. Gordon carried out a complete bacteriological examination of several horses killed while affected with grass sickness and could find no organism which could be associated with the cause of the disease, and also that inoculations of tissues from such animals into horses, mice, guinea-pigs and rabbits failed to set up grass sickness. I was interested to find that Dr. Gordon came across a streptococcus, doubtless the one which gave me so much food for thought in the early years of the grass sickness enquiry. In a private communication to me recently Dr. Gordon says: "Probably no one knows better than you do that the bacteriological examination of horses is something in the nature of an athletic feat." My own efforts to solve the grass sickness problem extended over five grass sickness seasons in co-operation with veterinary practitioners whose names are well known. The details of all this work were never published, for the simple reason that the bulk of the results were negative. Between 40 and 50 *post-mortem* examinations were carried out and in over 30 killed cases detailed bacteriological examinations were made. Experimental transmission was regarded as of more significance if attempted upon equines and 25 of these were used in addition to several sheep and many dozens of rabbits and guinea-pigs. Almost every conceivable method of transmission of the disease was attempted and all likely inocula were used, but it could never be said that any symptoms of grass sickness were reproduced. In the end it could only be admitted that all this effort had ended in negative results, though, of course, it must be remembered that negative results have their value. They help by eliminating unfruitful lines of research. These investigations quite definitely put an end to the unlikely theory that grass sickness was equine botulism. This theory had held sway for some years and necessitated the expenditure of much time, money and equine life before it could be disproved. The further investigations also disproved what at one time seemed a likely relationship between Borna disease and grass sickness, but the etiology of Borna disease shortly became better understood and settled the distinction between the two conditions.

It has therefore been some gratification to me, after my negative labours, to find a successor at this work marvelling at the athletic nature of a complete equine bacteriological examination. In view of his negative findings and his knowledge of the negative bacteriological work which had been done in previous years I can almost picture the relief with which Dr. Gordon must have taken up the idea of the possibility of entero-toxins being the cause of the disease and turning to that line of investigation. Grass sickness has long been regarded as a toxæmic condition, and a histo-pathological examination of the organs lends support to this view. It may be that Dr. Gordon has hit upon the right track, but I would be inclined myself to feel that a great many more positives and a higher proportion of positives must be found before great weight can be attached to the evidence.

One has become familiar in recent years with the desires of scientists other than veterinary scientists to take a hand in solving animal disease problems, and their success in some of our difficult problems would have been welcomed. Surely never was co-operation between scientists more eagerly welcomed than in the case of grass sickness, but it is questionable whether grass sickness research was advanced one iota by the accumulated advice of the botanists, biochemists, bacteriologists, pathologists, physiologists, chemists, etc., who were called in in the later stages of the enquiry and given an opportunity to make observations and enquiry. Animal disease problems are not by any means such as to hold out hope of easy victory to anyone, however brilliant. It would therefore be a cause of considerable satisfaction to us if Dr. Gordon's work on grass sickness eventually bears fruit. If the condition turns out to be an entero-toxæmia of the type suggested, immunisation of horses will probably solve the problem.

There is one part of Dr. Gordon's technique where I think error might creep in, and that is in allowing as long a period as 24 hours in judging toxicity effects upon mice following intravenous inoculation of Berkefeld filtrates of alimentary contents. Some of these filtrates must necessarily have been contaminated with bacteria and it is a question, to my mind, whether the death of mice in, say, 23 hours is evidence that a toxin existed in the alimentary canal contents when removed from the body of the horse or other animal. Beyond this I have nothing of actual criticism to offer on Dr. Gordon's paper. It is a simple, interesting and a clear narrative of sound work such as one has become accustomed to expect from Dr. Gordon.

Dr. W. A. Lethem, M.C., of the Ministry of Health, London, said that he would like to start by saying how very glad he was to have the opportunity of being present at the Congress of the N.V.M.A. as the official representative of the Ministry of Health. (Applause.) He was a newcomer to the veterinary world, but was not entirely ignorant of the progressive work that was being carried out by the veterinary profession. He had listened to Dr. Gordon's paper with very great interest.

During the past year or so his particular work had been with the protection of the food supply of the country, particularly meat and milk, and with those infectious diseases which were the common interests of both the veterinary and medical professions. He had become more and more convinced that progress would be made

by a close co-operation between these allied branches of what was virtually the same profession. (Hear, hear.)

Botulism was an example of a disease in man about which a great deal of knowledge was due to the work of veterinary research workers. There were certain references to botulism in scientific literature, particularly in Continental and other foreign literature, to an association between grass sickness in horses, limberneck in fowls in America, lamziekte in cattle in South Africa, and botulism in man. Whatever might be the position as regards limberneck and lamziekte, the doubt about grass sickness was cleared up some years ago, thanks in great part to work done in Scotland.

A most valuable part of Dr. Gordon's paper lay, he thought, not only in its support of the refutation of the statement that there was any such association between the two diseases, but also in showing what grass sickness was, thereby removing the cloud of uncertainty that had existed—and that in the minds of the less up-to-date still existed—in regard to it.

Major T. M. Inglis (Forfar) said that enterotoxæmia in animals was a subject of great interest to the general practitioner, and he felt that more study should be given to the organisms that were found in the intestinal tract. He was of opinion, too, that they would be better able to treat the ailments and disorders of the stomach and bowels if they understood thoroughly the different organisms that interfered with the natural functions of these organs. He was sure that much work had yet to be done in that direction by the research worker.

He had not sufficient confidence in his knowledge of research work to attempt to discuss that paper: what he had to say would be confined to the practical side in connection with grass sickness of horses as known in Scotland.

Those of them interested in that mysterious ailment were, he was sure, deeply grateful to the Animal Diseases Research Association for the amount of hard work they had put in from time to time in connection with grass sickness. Practitioners interested doubtless would be anxious to hear from Dr. Gordon in his paper that some progress had been made. On reading over the paper one would be inclined to look with suspicion on the group of anærobes of the *welchii* type. He had been particularly interested in that part of the paper describing an attempt to cause the disease artificially, and it was remarkable that, when the *post-mortem* was made, the lesions found were identical with those found in the animals that had died from natural infection. It made one anxious that that line of research should be continued, because it was the first time (as far as he was aware) a research worker had produced artificially any resemblance to the real malady.

It was yet too early to come to conclusions, but the *ovitoxicus* type of organism so often found in the bowel of these cases should be studied extensively and, if the result warranted it, then antitoxin should be tried with many hundreds of horses and with controls. He had injected six cases with the serum, but it was too late in the season to form any opinion as to its usefulness.

Being situated in a district which had been prone to the seasonal incidence of the disease known as grass sickness, he had had many years' experience of its varied forms, both as a practitioner and as an assistant in the research field. His experiences had led him to recognise many facts and factors relating to the onset, course, and forms of the disease without producing anything really tangible concerning the causative agent or combination of agents.

Grass sickness was seasonal, being most prevalent in the months of May, June and July, although cases both before and after this period were by no means uncommon. Peracute and acute cases were nearly always fatal. Subacute cases might recover, more especially if they occurred late in the season.

The symptoms exhibited in the peracute form, which as a general rule lasted for a few hours only, were much pain, distress, tympany and marked salivation. In the acute form the case lasted for about three days. The animal was uneasy, lying scraping, usually hoven, with patchy sweating over the quarters and under the tail. It did not exhibit symptoms of severe pain, but shivered almost continually, this being most pronounced at the elbows and stifles; salivation was again marked, and swallowing impossible or at best with difficulty. In the subacute form there was a primary severe colic, passing off in a day or so. The animal appeared bright and might continue so for a week or more before further symptoms appeared. Generally this phase was followed by the onset of rigors, a general uneasiness, suspension of bowel movement, marked salivation, and frequently twitching of the scapular and gluteal muscles; swallowing became more and more difficult. The animal rapidly lost condition, assuming the posture and tucked-up appearance so well known. It stood almost continually, always in the same place and generally with its hind quarters resting against the wall or hayrack. Bowel movement was suspended, no matter what medicines or quantity of medicines had been administered. It was astonishing how long animals suffering from the subacute form could live without having any relief from the bowels: in one instance under his observation, for a period of five weeks. This bowel stasis was not invariable. On occasion there was an apparently normal passage, even to the point of scouring; wasting, however, continued, and death generally ensued, though the recoveries recorded came from this type. The nasal chambers became encrusted and blocked, due to food material finding its way down the nose when the animal made abortive attempts to swallow. Broncho-pneumonia due to the same cause was sometimes found.

In all types the animal made a peculiar nasal sound, more especially if shivering were pronounced. He—and others—had attempted all lines of treatment, without avail—purges of all kinds were useless and very large doses were tolerated without apparent disturbance; naturally nausea was readily produced.

The *post-mortem* appearances were usually not interesting unless in the acute type, where they usually found a complete impaction of the large bowel, particularly the cæcum. The contents were in layers, very firmly packed together. This impaction was so severe in the acute form as almost to preclude rectal examination. The small intestine was either empty or fluid in content; the stomach was much distended with fluid contents. This condition he should like Dr. Gordon to explain, because the patient drank little or no water. The common lesions found were patches of subacute inflammation; the liver changed in colour to a very light brown. Not uncommonly there was a marked congestion around the larynx. Apart from these conditions the *post-mortem* was only of interest to the research worker.

For years he had held the opinion that more attention should be given to the grasses. His experience had always been that it was usually a grass-eating animal that was the victim. He had never had a case in a horse that had not been on a farm or in a town animal that had not been out in a country district. It was rather peculiar that they had most of their cases during the months of May and June, when grass was actively growing. Towards the end of June, and, incidentally, towards the end of the active growing season, they looked for less of the acute type of case, so for a percentage of recoveries. During the winter months they occasionally had a case, but he had only had these on a farm where the animal might get access to growth during his work. Temporary mildness with a corresponding freshness of pasture usually resulted in a case or two. Climatic conditions undoubtedly controlled the disease. Hot, dry weather favoured it; rain lessened the number of cases. The disease first manifested itself in isolated areas, other districts subsequently becoming involved.

He was sure the research workers could rely on the practitioner to give them every assistance in finding the cause of so troublesome a disease.

Major A. L. Robertson (Arbroath) observed that the more experience he had had of grass sickness, the more complicated the matter became. Major Inglis had given a very detailed description of the symptoms of grass sickness, but he had not mentioned the breathing of the animal. There was a peculiar sigh in the breathing, which he had not yet met with in any other affection. Possibly Mr. Gordon could account for that. Unless the animal had this sigh he would not diagnose the case as "grass sickness," even though all the other symptoms were present.

In many cases on which he had made a *post-mortem* he had found that the kidneys were affected. They appeared to undergo very rapid degeneration and frequently were like pulp.

He had had a case in a horse that had never had grass, though it was certainly in the middle of the grass sickness season. This year he had ten cases in January and February.

In regard to Dr. Gordon's experiments, he was particularly interested in horse No. 2, which received alkali followed by culture, for he might say that he had never had a case of grass sickness in a horse that received rock salt during the winter. That might be a coincidence, but he thought the fact worth mentioning in connection with that experimental case, in which the horse showed no symptoms or signs except a certain degree of loss of condition and inappetence.

For a long time he tried treating his cases with—among other things—saline and formalin, but he had given up that line of treatment because he thought the horses were more distressed after it.

Dr. Gordon had said: "In connection with grass sickness in Scotland, it will be remembered that this disease followed an improvement of the pastures, and especially after the introduction of wild white clover." He rather saved himself in making so sweeping a statement by bringing in wild white clover; but in his (Major Robertson's) opinion wild white clover had nothing to do with the disease.

He desired, in conclusion, to thank the investigators for the very arduous work they had performed in an endeavour to elucidate some of the mysterious factors attendant upon that most serious disease. They had been labouring at Arbroath at all hours of the day and night, and they had virtually lived in the knackeries—no enviable experience. (Hear, hear.)

Mr. Wm. C. Miller (Edinburgh) said that, in the first place, he had no criticism to offer or questions to ask, but since Dr. Gordon in his paper had referred to an instance which had occurred in a flock under his control in the Institute of Animal Genetics, he would like to mention in more detail some of the circumstances associated with it.

In some experiments carried out he had made an attempt to determine whether there was any basis for the belief, held by quite a number of people, that ewes which were allowed to pass through two or three œstral cycles before being served would produce a smaller proportion of twins than those which were served at the beginning of the breeding period. Between 50 and 60 ewes were deliberately kept from the ram for a period so that they would lamb some three to four-and-a-half weeks later than others which were served the first time they came into heat at the beginning of the breeding season. In the ewes from which the ram was withheld, lambing was due to begin in the first week of May, at a time when the grass was at its maximum growth. Some ten days or two weeks before lambing was due to commence, ten of these ewes became affected with a condition which could most correctly be described as a toxic condition (toxæmia) of pregnant ewes. Many people might have immediately concluded that the condition was identical with that described by M'Fadyean firstly, and by many others since, as "pregnancy toxæmia," but whether the two conditions were identical or not was uncertain. If they would allow him, he would like briefly to describe the most striking symptoms shown by these ewes.

Three ewes, which were quite typical, were noticed to be stiff and a little unsteady in the morning. By evening all three were down and could not rise. The pupils were dilated, there was rapid breathing and difficulty in swallowing was noticed when an attempt was made to dose them with glucose in water. From the nostrils of each there was a very copious discharge of greyish turbid fluid, and a gurgling noise was made at each inspiration and expiration, indicating that the fluid had either been secreted from the respiratory passages or had reached them by insufflation. Later it was found that the stomach and intestines contained a great excess of fluid, somewhat resembling what had been described by others as typical of acute grass sickness in horses. The ewes were dosed with sugar and glucose D in solution during the next 24 hours, in the belief that the condition might be a hypoglycæmic one associated with acidosis, but no improvement followed.

By the next day one ewe, and later the other two, began to show straining and weak labour pains. With great difficulty two large lambs from one, and one very large lamb from each of the others, were delivered. The membranes were very much decomposed, the lambs were dead, and the fœtal fluids were greatly reduced in amount. It was thought that the lambs probably died before the commencement of the visible symptoms, but of this one could not be sure. The lambs were slightly anasarcous.

No improvement in the condition of the ewes followed parturition, weakness increased and death took place two to three days later. In some cases death took place within 24 hours without any attempt to lamb. It was one of this latter type (the only one that died within this period which was sent to Moredun) in which Dr. Gordon had detected the presence of toxin in the bowel contents.

Post-mortem examination showed no very pronounced lesions. There was a faint more or less localised flushing of irregularly scattered areas of the small intestines, the liver was pale, the kidneys were dark in colour and of softer consistency than normal, the lungs were congested, and the bronchial passages contained a quantity of frothy fluid, while on opening the intestines a great excess of fluid was present. Little else of a definite nature could be determined.

Apart from the actual symptoms, there were some circumstances associated with this little outbreak which were in perhaps a general way reminiscent of the conditions associated with acute grass sickness in horses. Firstly, both conditions occurred most commonly at a time of the year when the grass was undergoing a phase of intensely rapid growth; secondly, hot or warm, dry "growing" weather favoured an outbreak, and rain seemed to check one; in both conditions there appeared to be an excessive secretion of fluid from the intestinal mucosa, and possibly by other secreting membranes. Admittedly there were differences. In ewes, pregnancy would appear to be a contributory cause, and the uterus in the cases met with contained either large twins, triplets, or else one very large lamb. This might possibly be associated with an excessively rapid growth rate of the fœtus during the last phase (pre-natal) of fœtal development, when an extra intake of protein by the dam could markedly increase the size of the fœtus at birth.

These circumstances might possibly have an influence upon the capacity of strains of *Cl. welchii* to produce a toxin in the bowel contents. It might be that before a sufficient multiplication of organisms could take place, or before a sufficient quantity of toxin could be elaborated, the alteration in the composition of the intestinal contents peculiar to the period of the year when grass was at its maximum growth phase, was necessary: in this way it would be possible to postulate a reason for the variety of clinical types met with in these cases of entero-toxæmias.

He would like to express his appreciation of Dr. Gordon's most excellent paper.

Dr. R. F. Montgomerie (Bangor) said that it had really given him very special pleasure to read that paper, as, of course, he had a special interest in entero-toxæmia for some few years, and he thought Dr. Gordon knew quite well, from personal conversations they had had, that he had his hearty congratulations for the work, carried on under conditions of great difficulty, which he had done particularly well. (Hear, hear.)

Professor Gaiger, he noticed, had said that he could imagine the delight with which Dr. Gordon was able to say that he had real evidence that grass sickness might be an entero-toxæmia: he (Dr. Montgomerie) could imagine it also, because he could remember his first experience of evidence that he was working with an entero-toxæmia, in his investigations into pulpy kidney disease.

He would just like, if he might do so, to question one little statement in Dr. Gordon's paper. The essayist had said, under the heading of "Literature," that dysentery in lambs was proved by Dalling in 1926 to be due to the invasion of the intestinal wall by a type of *Clostridium welchii* (the lamb dysentery bacillus). He (the speaker) did want to suggest that that was never really proved at all. He was not belittling Dalling's work in the least, and he too had reason to acknowledge assistance from that source, but what he was suggesting was that that was not Dalling's finding. Dalling did eventually get people to accept that the lamb dysentery bacillus was the cause of lamb dysentery, but he did not think he ever stated that the disease was due to the invasion of the bowel wall by the organism. In fact, work carried on in North Wales as far back as 1931, and since, had always convinced them that lamb dysentery, after all, was quite definitely an entero-toxæmia, and that the ulceration which one found in the bowel wall was the result of the action of the necrotic fraction of the toxin which the lamb dysentery bacillus produced.

They had had placed before them the real significance of that type of disease in animal husbandry, and he agreed with Dr. Gordon's statement that there were probably other diseases of farm stock which were of that nature, and that any investigation into disease of farm stock would be incomplete if the question of the presence of organisms of the entero-toxæmia group in the bowel were not investigated.

Dr. Gordon conveyed some suggestion in his paper that he had some reason to apologise for the small percentage of successes he had had in detecting toxins. To his (Dr. Montgomerie's) mind Dr. Gordon had done very well to detect toxin in the bowel contents in 23 cases. We knew that in certain cases of grass sickness there occurred a very remarkable flooding of the intestine with fluid, so that in the presence of so much fluid that percentage of successes was also quite remarkable and was much more significant than was indicated by the figure itself. They in North Wales had, of course, a very similar experience in their cases of entero-toxæmia in ewes and lambs: they had encountered this difficulty in isolating *Clostridium welchii* of the *ovitoxicus* type under certain circumstances. It seemed to him remarkable that Bennetts could report the presence of the *ovitoxicus* type in pure culture in all his cases in ewes.

In view of the difficulty that Dr. Gordon had experienced, he would like to ask him if any long period elapsed between his taking of the original culture and his attempt to isolate the *ovitoxicus* type of *B. welchii*—an attempt that, of course, met with failure. In that connection he might say that in a long series of lamb dysentery cases they were able to isolate regularly the lamb dysentery type of *Bacillus welchii* and to isolate it almost regularly in pure culture, whereas when they came to deal with those outbreaks due to the *ovitoxicus* type of *welchii*, the organisms of that type showed a tendency to die out.

He had noticed in the discussion that morning that grass sickness had occupied a very large part and there had, he thought, been made some mention of the hope which lay in the use of serum. For that reason it might interest some of them to know that in North Wales they had had a limited opportunity to try the use of *ovitoxicus* serum in the treatment of pulpy kidney disease in lambs. They had had literally no success, although the serum had been used in very large doses. The lambs affected with the subacute or chronic type of disease had lived on for days in a paralytical state until they had been slaughtered. He therefore thought the injection of serum would make very little difference in grass sickness if the symptoms were already in evidence, as the toxin had already attached itself to the nervous system. On the other hand, they had had quite promising results

from the use of serum to give protection over a short period and also from the use of vaccine to give a more lasting immunity.

Anyone who had had any experience of entero-toxæmias was very well acquainted with the difficulty of reproducing the disease, and he wondered if Dr. Gordon had really reproduced grass sickness or something simulating the natural disease. Nobody had ever reproduced pulpy kidney disease in lambs, and he suggested that Dr. Gordon had had literally to go to extremes in preparing his case in order to reproduce a toxæmic condition with symptoms like those of grass sickness.

It seemed to him that there was some very remarkable factor that prepared the way for the introduction of the *ovitoxicus* type of *B. welchii*. Had Dr. Gordon any conjectures as to the way in which the contents of the alimentary tract were prepared as a good medium for that organism? The period at which there was a rapid growth of young grass seemed to be the period which introduced the circumstances which allowed *B. ovitoxicus* to go ahead.

Major G. E. Oxspring (R.A.V.C.) stated that he was particularly interested in the subject of grass sickness, because in the Royal Army Veterinary Corps this last summer they had been rather badly hit with it; in fact, on Salisbury Plain they had lost, at one place only, as many as 24 valuable horses. The ravages of the disease also played a great part at the depôts.

In that particular outbreak on Salisbury Plain he was called in to make an investigation and he found, on *post-mortem* examination, that pathologically it was a toxæmia. He inoculated intestinal and stomach filtrates into laboratory animals and in no case was he able to produce any effect. These filtrates were injected within four hours of their preparation, and whether or not that failure was due to his technique being at fault, as might well be the case, he did not know; nevertheless, the failure mentioned was an interesting point.

Another point was that Scotland appeared to be losing its monopoly of that disease, which was steadily progressing down south: whether it had existed in the south all the time and had only been diagnosed as a form of colic he did not know.

On Salisbury Plain the disease occurred on land which had not had any fertilisation of any kind; *i.e.*, the question of the influence upon the disease of the use of artificial fertilisers on the land appeared to be ruled out entirely in these R.A.V.C. cases.

Another point of interest was that, although all the horses were kept under identical conditions, the percentage of animals affected was comparatively low.

Mr. Hugh Begg (Lanarkshire) observed that it had occurred to him to sound one note, namely, that although the subject under discussion was intimately associated with the bovine species in that this species, also, suffered from entero-toxæmia, no mention of bovines was made in this paper. They examined upwards of 300 carcases of animals in Lanarkshire per year for the detection of anthrax, and their experience was to meet with quite a big increase of sudden deaths in the spring, when growth began. Whether these deaths, or the majority of them, were exclusively due to tetany he did not know. A common experience (when the young grass, rich in protein, began to come up) was to have a sudden death reported among cattle out-wintered in the fields. Subsequently one or two similar sudden deaths would occur among the same bunch of cattle, and as the cattle and the field had been the same for months it was obvious that the nature of the grass only had changed.

Presumably the rich protein content of the rapidly-growing young grass induced a fatal state of hypocalcæmia.

On the other hand, it might be argued that some of these deaths were due to an entero-toxæmia.

In 1927 he examined 76 bovine carcases in the last three weeks of the month of May, when balmy growing weather suddenly succeeded wintry conditions. In every case death was sudden and unexpected and that large number was no measure of the actual death-rate, because in many instances dying animals were seen by veterinary surgeons who did not report them because they did not suspect anthrax as the cause of illness and death.

Could the essayist separate those cases that could definitely be regarded as tetany produced by the ingestion of young grass from those which were possibly due to a type of entero-toxæmia, which killed just as quickly and with apparently just the same symptoms?

Under the Diseases of Animals (Lanarkshire) Order, 1907, all sudden deaths of bovines unattended by a veterinary surgeon willing to certify the absence of anthrax were reportable, and that Order provided a much finer sieve for the detection of anthrax than the Anthrax Order itself, and no stock owner could with impunity fail to notify the local authority or bury or send the unexamined carcase to the knackery.

All sudden changes in feeding were irksome, but those occurring in the springtime were especially associated with fatalities. Herein lay the problem that was much in need of research work, for in some years the loss was very great.

Major A. Spreull (Dundee) said that it was now some 26 years since he had the temerity to put grass sickness on paper for the first time, and he thought he could say that the longer one lived and the more one saw of it, the less one knew about it. He would be very pleased if Dr. Gordon had at last struck what might turn out to be a certainty in grass sickness: they had had so many experimental failures in their attack on the disease up to now.

With the wide experience of grass sickness that he (Major Spreull) had had, he thought it was always very wise to be chary at the beginning of a case in stating that it was one of grass sickness. He was quite sure that all his brother practitioners who had had much experience of that disease would agree with him that they had all been cheated and that many cases that simulated grass sickness turned out really to be some ordinary impaction. In the spring of this year he had two cases of what he considered to be acute grass sickness, with all symptoms present, even to the difficulty in swallowing and in passing the stomach tube, due to the paralysis of the throat, which in some cases made it impossible to pass the tube. Both cases recovered after the stomach tube had been passed and they had been washed out with saline solution and formalin, which proved, to his mind, that, after all, the condition could not have been grass sickness.

It had not been mentioned that they had had quite a number of subacute cases in mares in foal. They had managed to foal safely and there had been no infection of the foal, which had been reared quite successfully by a foster-mother or on milk.

Another point he would bring out was that,

so far as he could see, one attack of grass sickness in one season did not give any immunity to another attack. He had, on two occasions, seen the same animal attacked more than once, and on both occasions the animal died.

In some of those subacute cases he had found that if they could get the horse to eat plenty of potatoes then they could secure recovery. Whether the reason lay in the pultaceous nature of the potato, or whether solanine had some particular effect on the organisms they had been hearing about, he could not tell, but he had had one or two cases in which the animal was down and had to be helped up by the tail and in which he had fed sliced potatoes, when the horse gradually regained strength and condition; in fact, one of them was now performing in a well-known circus.

Mr. W. J. Rice (Montrose) said that he merely desired to amplify the report presented in Dr. Gordon's paper on the sheep that had been forwarded by him (Mr. Rice) for examination by the essayist. He had also put in touch with Dr. Gordon another farmer from the north, whom he instructed to forward carcases direct to the institute. This farmer had failed to advise Dr. Gordon that the carcases were being sent on his (Mr. Rice's) instructions, so that Dr. Gordon was not aware that these latter carcases were part of the same investigation. Dr. Gordon had since told him that *ovitoxicus* was also found in these particular sheep. Furthermore, since Dr. Gordon had returned to Edinburgh, he (Mr. Rice) had had a few more deaths on another farm of a similar nature, with the same symptoms, and the *post-mortems* revealing the same features.

The peculiar point in all these sheep casualties was that all of them occurred on fields in which grass sickness had been reported in previous years.

Another point that struck him as very definite was that the *post-mortem* revealed so much fluid in the stomach and intestines: the feature so commonly found in the horse with grass sickness. It seemed to him, therefore, that if there were a toxin present in grass sickness, and if there were an extravasation of fluid into the alimentary canal associated with the presence of such toxin, then Dr. Gordon would be on the right lines in investigating grass sickness as a "toxin-produced condition."

It was for the practitioner, therefore, to assist Dr. Gordon's research into this matter in every way possible, and particularly by forwarding all the material that he could.

Major-General Sir John Moore (London) said that he was very glad indeed that the subject of grass sickness had been taken up by the profession, for, personally, he thought that a very serious condition of affairs existed in regard to it. The disease was gradually spreading from Scotland all the way down the east coast of England and was now, he understood, in Kent. In his own county, Northumberland, a brother of his had lost two very valuable young animals from it, and he (Sir John) was very glad that the Agricultural Research Council, of which he was a member, were taking up that urgent matter of research into the disease.

He wanted to relate a little incident that occurred in France during the Great War. They were blamed for the loss of certain animals at a village near Abbéville, the allegation being that their drinking pond was poisoned with carbide from the mechanical transport. He was sent along to investigate this, and he found that they were cases of what might be termed Borna disease, though he was not quite sure about that. He had a look at the pond, which was dirty, as were most village ponds in France, took a sample of the water and sent it for analysis. The report was "grossly contaminated with sewage," so that the complainants did not get any further with their charge and their claim for compensation for poisoning of the animals.

The Reply

Dr. W. S. Gordon, replying, said that, in the first place, he would like to thank the members very much for the comprehensive nature of the discussion, and for their all-too-flattering remarks.

Professor Gaiger, who had opened the discussion, had once performed a similar office on a previous occasion on which the writer had prepared a paper. At that time Professor Gaiger was Professor of Pathology at the Glasgow Veterinary College and he was a student in his class; on the present occasion, however, he (Dr. Gordon) was in a more fortunate position than on the last, since he was allowed the privilege of replying to the Professor's criticisms. (Laughter.)

In opening the discussion, Professor Gaiger had covered a very interesting field. He had focussed attention on a variety of characteristics exhibited by organisms of the anærobic group. Thus, some were not tissue invaders but produced toxins outside the body which, on injection, proved fatal, some remained localised in wounds and there produced toxins which caused death, whilst others were true tissue invaders and lived, multiplied and produced their toxins within the tissues. *Cl. welchii* type D had apparently low tissue invasive powers, but it appeared under certain conditions to be capable of producing its toxin in the digestive tract and, if absorbed, this toxin might be responsible for acute symptoms and death in a very short period.

Professor Gaiger had emphasised the point that a great many more positives and a higher proportion of positives would be necessary before definite conclusions could be drawn. This Dr. Gordon admitted, but if he referred Professor Gaiger to Dr. Montgomerie's remarks there he would find that it was not surprising that only a small number of positives had so far been obtained. In addition to that they had now detected the toxin of *B. ovitoxicus* in the alimentary canal of six horses affected with grass sickness and in all probability further experience in this work would enable them to confine their examinations to specially selected acute cases which might yield a higher proportion of positives. Professor Gaiger had apparently also experienced the difficulty of obtaining positives, since he recorded the examination of 22 animals and in only three was there evidence of toxin in the digestive tract.

Finally, Professor Gaiger had suggested that in the technique described error might creep in by allowing as long a period as 24 hours in judging toxicity effects upon mice following intravenous inoculation of Berkefeld filtrates of alimentary contents. Generally, when *ovitoxicus* toxin was present in a bowel filtrate the mice inoculated died within six hours, but occasionally when a very small quantity of toxin was present mice might take about twelve to 24 hours to die. In such cases, however, it was not assumed that *ovitoxicus* toxin was the cause of death unless the specific antitoxin was capable of neutralising the toxic product present. When positive results were obtained with any filtrate the neutralisation tests were always repeated a number of times and when such precautions

were adopted there was little reason to believe that error was liable to occur. In the positive cases recorded in this paper the mice died within twelve hours of injection.

Dr. Lethem had raised the question of botulism, which had often been referred to when grass sickness was discussed. There was now plenty of evidence to refute the alleged relationship between botulism and grass sickness in horses. He (Dr. Gordon) thought he might further emphasise Dr. Lethem's remarks by saying that they had not detected botulinus toxin in the digestive tract of horses affected with grass sickness nor had they been able to neutralise botulinus toxin with serum obtained from subacute or recovered cases of that disease.

From the clinical viewpoint Major Inglis had made a valuable contribution to the discussion. The Animal Diseases Research Association were deeply indebted to the practitioners who had facilitated the investigation of the disease by placing at their disposal an unlimited supply of material; in fact, they had always had more material than they could deal with adequately, but the future had to be considered; they would certainly require more material, and it was gratifying to know that they were not going to have any difficulty in obtaining it. Amongst the various types of case described by Major Inglis he had referred to one in which the animal did not pass fæces for a period of five weeks. If *ovitoxicus* toxin were the cause of this disease perhaps it was a case in which a limited quantity of toxin had been elaborated in the bowel in the early stage of the infection and that absorption of this material over a long period was responsible for the chronic type of case. Major Inglis referred to the enormous quantity of fluid in the stomach of acute cases, and wished to know from whence the fluid emanated. He could not say from whence all of it came, but it had been suggested that a great deal of it might be due to the copious secretion of saliva which was swallowed. Difficulty in swallowing, however, was a symptom of grass sickness noted by many observers, and in many cases the saliva ran from the mouth. At the present time the question was one which could only be answered by conjecture, and the view might be held that the accumulation of fluid in the digestive tract was the reaction on the part of the tissues against the toxin in the alimentary canal and was nature's attempt to neutralise or dilute the noxious product present in the bowel.

Major Robertson had drawn attention to the sighing respiration manifested by infected horses, and Mr. Miller had directed their notice to the laboured respirations in affected sheep. He thought it possible that these symptoms could be accounted for by the fact that the toxin might have an effect on the respiratory centre. Injection of mice with *ovitoxicus* toxin produced accelerated and laboured respirations. Major Robertson's observation on the pulpy kidney change was a very significant one, since this was a characteristic change in infectious entero-toxæmia of sheep as described by Bennetts in Australia, and this disease was caused by the toxin of *B. ovitoxicus*. Dr. Montgomerie, working in Wales, had also observed a pulpy kidney change in lambs affected with entero-toxæmia. In regard to the statement by Major Robertson that he had never had a case of grass sickness in a horse which had received rock salt during the winter, that seemed a very important finding and one which Major Robertson should pursue further.

It would be unwise definitely to associate wild white clover or any type of pasture with grass sickness, because cases occurred on most types of grazing. The majority of cases, however, seemed to occur when animals had access to highly succulent herbage, but if organisms of the *welchii* group were responsible for the disease, then any type of feeding which favoured the growth of these organisms in the bowel might set the disease process in motion.

Referring to Dr. Montgomerie's point regarding the invasion of the bowel wall by the lamb dysentery bacillus, it was possible that he (the essayist) had not been quite accurate concerning it, but Major Dalling, who also had read the paper before it was published, had not detected the inaccuracy, and he must congratulate Dr. Montgomerie on his accurate powers of observation. (Laughter.) Dr. Montgomerie would no doubt agree with him that in certain cases of lamb dysentery there was a definite gas gangrene of the bowel wall, and such a lesion, he thought, indicated invasion of the bowel wall by the causal organism. He agreed, of course, that only in very rare instances did the organism invade the tissues further than this. As a result of the essayist's remarks in opening the paper, Dr. Montgomerie had apparently taken it that there were eleven cases of grass sickness in which *ovitoxicus* toxin was detected. This was not quite correct; there were eleven cases in which the bowel filtrate was toxic, in six of these the toxin present was definitely determined as *ovitoxicus* toxin; in two no antitoxin in their possession was capable of neutralising the toxin, and in three the toxin was not present in sufficient concentration to enable them to determine its nature.

Apparently Dr. Montgomerie had also experienced difficulty in isolating *Cl. welchii* type D from the alimentary canal of cases of entero-toxæmia, and he asked if there was any difference in technique in their successful case as compared with the unsuccessful cases. The explanation might be that in the first cases they had dried a small quantity of bowel contents on porous porcelain plates, powdered the dry material and sowed it on blood agar plates. Colonies of *Cl. welchii* were obtained; these were typed and found to be type A. In the successful case the material used was fresh bowel contents transferred directly to meat broth and incubated; as soon as growth appeared rapid subcultivation was carried out for a number of generations and then blood agar plates were sown. Colonies of *Cl. welchii* were obtained, and when typed were found to be type D. It might be, therefore, that examinations had to be made with fresh material.

He was very glad to know that Dr. Montgomerie had already attempted the treatment of cases of entero-toxæmia with *ovitoxicus* antitoxin. He also agreed that serum treatment would have little application, but he was extremely interested to note that Dr. Montgomerie was getting encouraging results in the prevention of the disease by the use of vaccines and sera. These successes suggested that they might eventually be able to immunise horses on similar lines.

He would not be prepared to say whether the experimental case was grass sickness or not, especially in view of the massive dose of culture which had been fed. Had the case occurred in the grass sickness area it would probably have been diagnosed as grass sickness, but further experimentation was necessary before definite conclusions could be drawn.

Major Oxspring's observations on the outbreak of grass sickness on Salisbury Plain were of con-

siderable importance, since here was an opportunity of running an experiment in a large number of horses all grazed together: half could be immunised and half left untreated.

It was interesting to note that Major Oxspring had prepared filtrates from a number of cases, but, so far, had not detected a positive. It was obvious that a large number of examinations had to be made, and the only cases worth working with were the very acute or peracute type.

He thought Mr. Hugh Begg's contribution to the discussion was a most valuable one, since he had introduced the subject of sudden death in cattle from undetermined cause. Only a small percentage of these sudden deaths were due to anthrax, whilst a big percentage were probably just classified as "staggers" of some variety. The possibility of some of these cases being entero-toxæmia had yet to be explored. He thought it would be quite possible to separate deaths due to tetany and those due to entero-toxæmia. The type of case they wanted material from was the animal which became affected and died within 24 hours. That these cases coincided with a sudden flush of new grass was of great significance, since that corresponded with the conditions which favoured grass sickness in horses.

Major Spreull had made an original contribution, but they would not always be successful in getting horses affected with grass sickness to accept potatoes, and if they were determined to give potatoes the route employed would need to be the stomach tube, which would probably present considerable difficulty. (Laughter.)

Continuing, Dr. Gordon said that there were one or two points raised in the discussion upon which he felt he might say a few words. The first was in connection with the vaccines which had been tried for the prevention of white scour.

They had been asked, from time to time, what they could do to prevent white scour, and the usual reply was that they could do nothing to prevent it until the cause of the condition had been investigated more fully. In certain cases, however, they had inoculated culture medium with material from the intestinal contents and heart blood of calves affected with white scour, and in some instances they had isolated a Gram-negative organism from the heart blood. They had made an autogenous vaccine from that organism for one farm, and vaccinated all the calves on the farm with the exception of one. The only animal which died from white scour during the year in which vaccination was practised was the one which had not been vaccinated. He did not consider that the result was significant, but it was quite suggestive.

The second point raised was the possibility of the disease being an entero-toxæmia. In this connection they had made filtrates from the contents of the small intestines of a few calves affected with white scour, and in the examinations carried out these filtrates had proved to be non-toxic. That, however, did not negative the theory, because the calves examined had all lived for several days before the tests were carried out, and to be a true guide the examinations would probably have to be made very shortly after the animal was affected.

In discussing possible methods of controlling the disease with Mr. Smith, they thought they might try a convalescent serum. On the farms where Mr. Smith was conducting his investigation, blood was drawn from certain animals which had made a satisfactory recovery following white scour infection and the serum was used for protective purposes in certain herds. The result of this experiment, as Mr. Smith had indicated, was not yet available, but he (Dr. Gordon) was afraid that all these pieces of work that had been done were merely dabbling round the fringe of a very big subject, and one which should really be on the research programme, not merely of one research centre, but of several, because the disease was of such a widespread nature and the cause of serious economic loss.

In conclusion, Dr. Gordon thanked the members for the kind way in which they had received the paper and for the patience they had shown in listening to him.

N.V.M.A. Divisional Report

DUMFRIES AND GALLOWAY V.M.A.*

SOCIAL MEETING AT APPLEBY

The Summer (Social) Meeting of the above Division was held at the King's Head Hotel, Appleby, on Thursday, June 28th, 1934. The President, Mr. O. Stinson, Appleby, presided, and the following members were present:—Messrs. J. Brennan, W. T. Hewetson, A. J. Kennedy, R. Craig Robinson, R. Simpson, A. Young, and G. A. Sangster (Honorary Secretary).

The following visitors were also present:—Mr. Brown, Dumfries, Mrs. Hewetson, Mrs. Kennedy, Miss Miller, Mrs. Sangster, Mrs. Simpson, Mr. and Mrs. A. P. Steele, Dumfries, Mrs. and Miss Stinson and Mrs. Young.

The minutes, as published, were approved on the motion of Mr. R. Simpson, seconded by Mr. R. Craig Robinson.

The President reported that one of the members—Mr. James Lindsay, Dumfries—was very ill. The Secretary was instructed to convey to Mr. and Mrs. Lindsay, either personally or by letter, the members' regret at his illness and the assurance of their kind thoughts.

Obituary.—The President asked the members to stand and pay tribute to the memory of one of their members, Mr. N. H. McAlister, Kirkcudbright, a much-respected friend and colleague. The Secretary was instructed to convey to Mrs. McAlister the sympathy of the members of the Division.

Apologies for absence were received from:—Miss Burnett, Messrs. F. J. L. Croudace, F. A. Davidson, G. D. W. Davidson, Dr. Dryerre, Mr. A. S. Ferguson, Dr. J. Russell Greig, Messrs. J. Lindsay, A. J. Milligan, J. Reid, Craig Robinson, Jr., W. Scott and A. Steele.

Correspondence.—The following items (all emanating from the N.V.M.A.) were dealt with.

(1) Statement of the evidence sent to the Commission for the Marketing of Eggs and Poultry. This was approved.

*Received for publication July 26th.

(2) Evidence for the consideration of the Technical Committee on Abattoirs and Abattoir design. This also was approved.

(3) *Re* Report of the Economic Advisory Council Committee on Cattle Diseases. (Approved.)

A report was presented by the Secretary in regard to the Practitioners' Committee *re* Patent Medicines, etc.

A discussion took place with regard to certain chemists using the title "Veterinary Chemists," when Captain Simpson, a member of the Council of the R.C.V.S., was asked to bring the fact to the notice of that body.

R.C.V.S. Library.—A letter was read from the Secretary of the R.C.V.S. with regard to the Endowment Fund for the Library of the Royal College. It was unanimously agreed to send a subscription of £1 1s.

Nomination of New Member.—Mr. A. P. Steele, Dumfries, was proposed for membership by Mr. A. J. Kennedy, seconded by Mr. G. A. Sangster.

Social Programme.—After lunch at the hotel, the President, Mr. Stinson, had arranged a very enjoyable afternoon for the members and their friends. The party was escorted by Mr. Jeffreys through the gardens and grounds of Lowther Castle. The beautiful surroundings in which the guests found themselves were the source of much pleasure and sincere admiration. Later the party was entertained to tea in the George Hotel, by Mr. Stinson, when Mrs. and Miss Stinson proved themselves charming hostesses. In spite of the somewhat inclement weather, the day will be recorded in the annals of the association as a most successful and enjoyable one.

On the motion of Mr. Young, Dumfries, the President was accorded a hearty vote of thanks and Mr. Stinson suitably replied.

George A. Sangster, *Hon. Secretary.*

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

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DIARY OF EVENTS

Aug. 25th.—Special Meeting of the North Wales Division, N.V.M.A., at Llandudno Junction.

Aug. 27th.—Meeting of the Editorial Committee, N.V.M.A., at 2, Verulam Buildings, Gray's Inn, W.C.1, at 4.30 p.m.

Sept. 7th.—Meeting of the Southern Counties Division, N.V.M.A., at Bournemouth.

Sept. 24th-25th.—Examination for award of Jubilee Memorial Bursary.

Sept. 26th.—Meeting of the Lancashire Division, N.V.M.A., at Manchester.

Oct. 3rd.—R.C.V.S. Committee Meetings.

Oct. 4th.—R.C.V.S. Committee Meetings. Victoria Veterinary Benevolent Fund Council Meeting.

Oct. 5th.—R.C.V.S. Committee and Council Meetings.

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THE 1934 CONGRESS NUMBER

Members or subscribers requiring additional copies of this issue are requested to make early application to the Editorial Representative, N.V.M.A., 2, Verulam Buildings, Gray's Inn, W.C.1, enclosing remittance at the rate of one shilling a copy, post free.

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CONGRESS GROUP PHOTOGRAPH

Copies of the Congress Group photograph in this issue can be obtained, price 5s. per copy, post free, from Messrs. E. R. Yerbury & Son, 92, Morningside Road, Edinburgh 10.

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We desire to express our thanks to Messrs. W. Gardner (Maybole) and J. W. H. Holmes (London) for the photographs which contribute so materially to the interest of this Congress Number.

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ROYAL (DICK) VETERINARY COLLEGE ALUMNUS ASSOCIATION

At the Annual Meeting and Dinner of the Royal (Dick) Veterinary College Alumnus Association, held on August 2nd in Edinburgh, a collection was made for the benefit of the Victoria Veterinary Benevolent Fund. The sum of £8 was realised, and a cheque for that amount has been sent to the Secretary of the Fund.

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R.C.V.S. OBITUARY

Pratt, Edward Hartley, of Northallerton, Chief Veterinary Officer, North Riding of Yorkshire. Graduated Edinburgh, May 26th, 1893; died August 11th, 1934, aged 67 years.

The Late Mr. E. H. Pratt

Mr. Edward Hartley Pratt, whose death we record with much regret, went to Northallerton as a young man and was appointed on the foundation of the county council in 1888 as a part-time veterinary officer.

With the passing of several Acts of Parliament dealing with diseases of animals, and the issue of subsequent Orders, Mr. Pratt's duties increased, and in 1901 he was appointed part-time veterinary inspector.

The passing of the Milk and Dairies Order in 1928 resulted in a further increase in his work, and Mr. Pratt became a full-time permanent official of the county council as their chief veterinary officer.

He was known to agriculturists throughout the Riding, for before becoming a full-time officer he frequently lectured to gatherings of farmers on the symptoms of cattle diseases.

He leaves a widow and two sons, one of whom is assistant inspector to the county council and

the other in business as an automobile engineer in Northallerton.

At the funeral service at the Parish Church of All Saints, Northallerton, the county council staff and health services were fully represented, while Mr. H. Watson represented the Yorkshire Veterinary Medical Society and Major D. S. Rabagliati the West Riding County Council veterinary staff.

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PERSONAL

Marriage.—Smith Leask—Dowse.—On August 18th, at St. John's Church, Blackheath, R. I. Smith Leask, M.R.C.V.S., of Largs, Scotland, to Edith Dowse, of Blackheath, London. Mr. F. Land, M.R.C.V.S., of Bow, London, acted as best man, and the honeymoon is being spent at Eastbourne.

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ARMY VETERINARY SERVICE

London Gazette—War Office—Regular Army

Aug. 17th.—The undermentioned to be Lts. (on prob.), Aug. 18th, 1934: E. H. Lewis-Bowen, K. I. Barlow, R. H. Duff.

Correspondence

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

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HERD EXAMINATION UNDER THE ACCREDITED PRODUCERS SCHEME

To the Editor of the Veterinary Record

Sir,—The answer to Mr. Sewell's query in your last issue is to be found in the particulars of the Accredited Producers Scheme issued by the Milk Marketing Board from their headquarters at Thames House, Millbank, dated August 2nd, 1934.

It is here stated that applicants for registration must furnish the Board with a certificate of health of their herd granted by the county veterinary officer (or, where there is no county veterinary staff, then by a qualified veterinary practitioner approved by the Ministry of Health). Thereafter it is the producer's responsibility to supply the Board, either directly or through the local authority, evidence that the health of the herd is maintained, and his animals must be inspected at intervals of not more than six months by an approved veterinary surgeon, who, on each occasion, shall furnish the necessary certificate.

It will be seen by the above that the examination of the herds will not necessarily be in the hands of whole-time veterinary officers, but whereas the approved practitioners will naturally require a fee for the examination and the county council will not, it is not difficult to forecast who will examine the majority of the herds.

Yours faithfully,
Donald Johnston,
County Veterinary Officer.

County Hall,
Lewes.
August 20th, 1934.

The Editor acknowledges, with thanks, the receipt of the following:—

Communications from Mr. Harold Burrow (Birkenhead), Mr. E. G. Conisbee (Kimbolton), Major G. W. Dunkin (Mill Hill), Mr. W. K. Johnstone (Manchester), Major-General Sir John Moore (Hampstead) and Mr. L. E. Perkins (Durham).

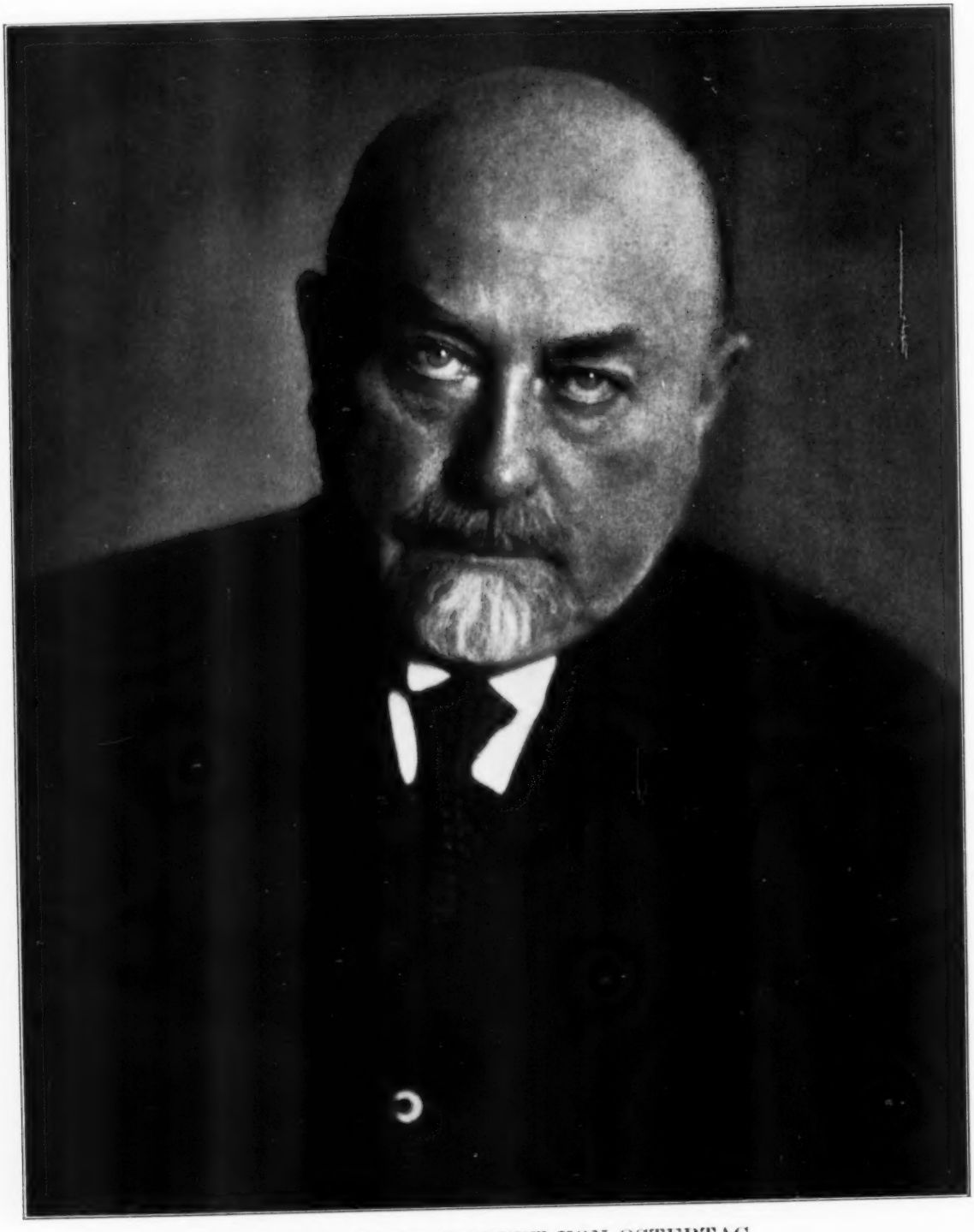
Reports of meetings of the following Divisions, N.V.M.A., from their respective Hon. Secretaries: Derbyshire, Dumfries and Galloway, Eastern Counties, and Midland Counties.

Diseases of Animals Acts.

SUMMARY OF RETURNS

Period.	Anthrax.		Foot-and-Mouth Disease.		Parasitic§ Mange.		Sheep Scab.	Swine Fever.	
	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Animals slaughtered as diseased or exposed to infection.	Outbreaks reported by the Local Authorities.	Animals attacked.	Outbreaks confirmed.	Outbreaks confirmed.	Swine slaughtered.
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Period 1st to 15th August, 1934	15	18	—	—	1	1	23	61	30
Corresponding period in									
1933	11	16	2	9	—	—	13	32	28
1932	9	11	3	204	7	7	10	39	31
1931	6	10	5	241	2	2	4	33	5
Total 1st January to 15th August, 1934	247	273	2	93	93	154	375	1,035	643
Corresponding period in									
1933	184	210	58	5,359	102	178	225	970	589
1932	246	303	6	562	96	156	146	1,180	585
1931	319	355	79	8,478	104	171	195	1,249	511

Note.—The figures for the current yearare approximate only. § Excluding outbreaks in Army Horses.



PROFESSOR DR. ROBERT VON OSTERTAG